IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

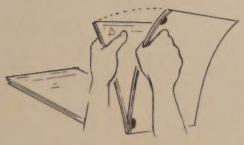
TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.



3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 524 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MARCH 1961

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

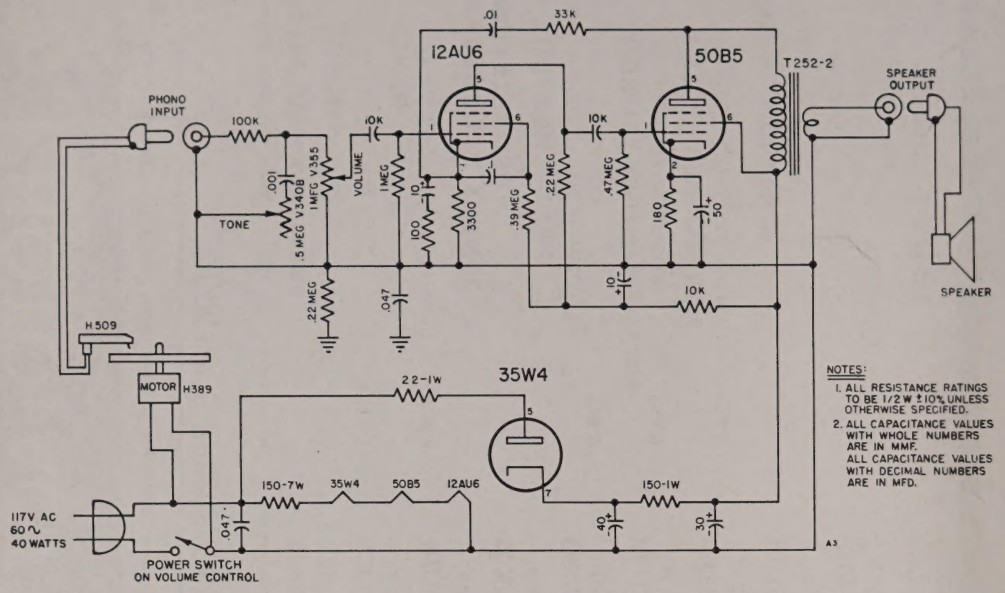
IN THIS ISSUE OF THE SERVICER:

Bell Sound
Model 2300

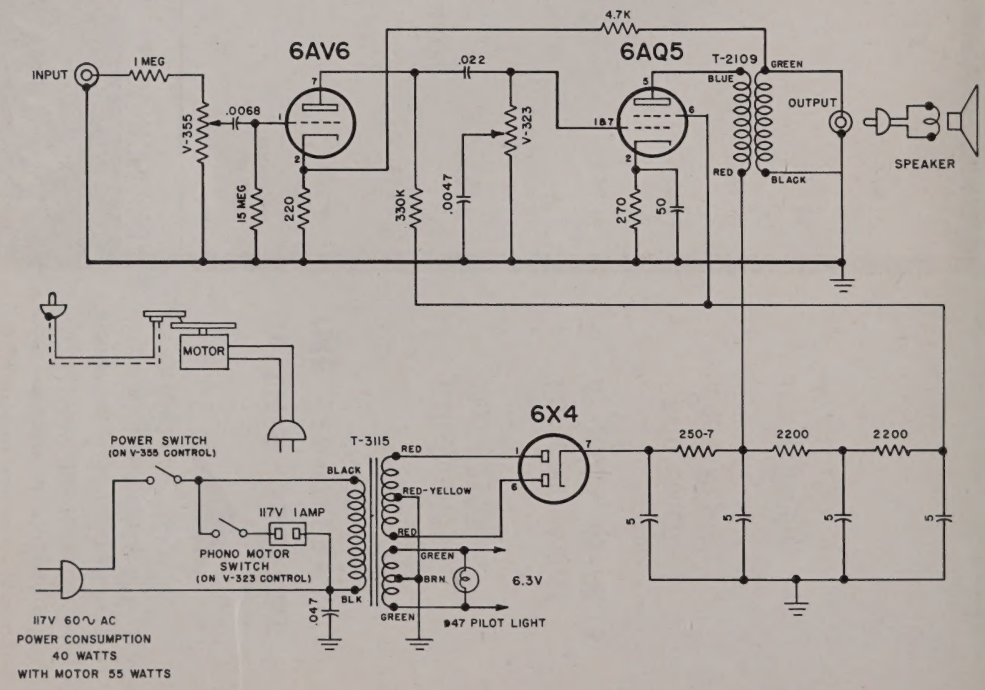
Coronado Models
43-7800A, 43-7801A

David Bogen
Model PE3

David Bogen
Model PE5

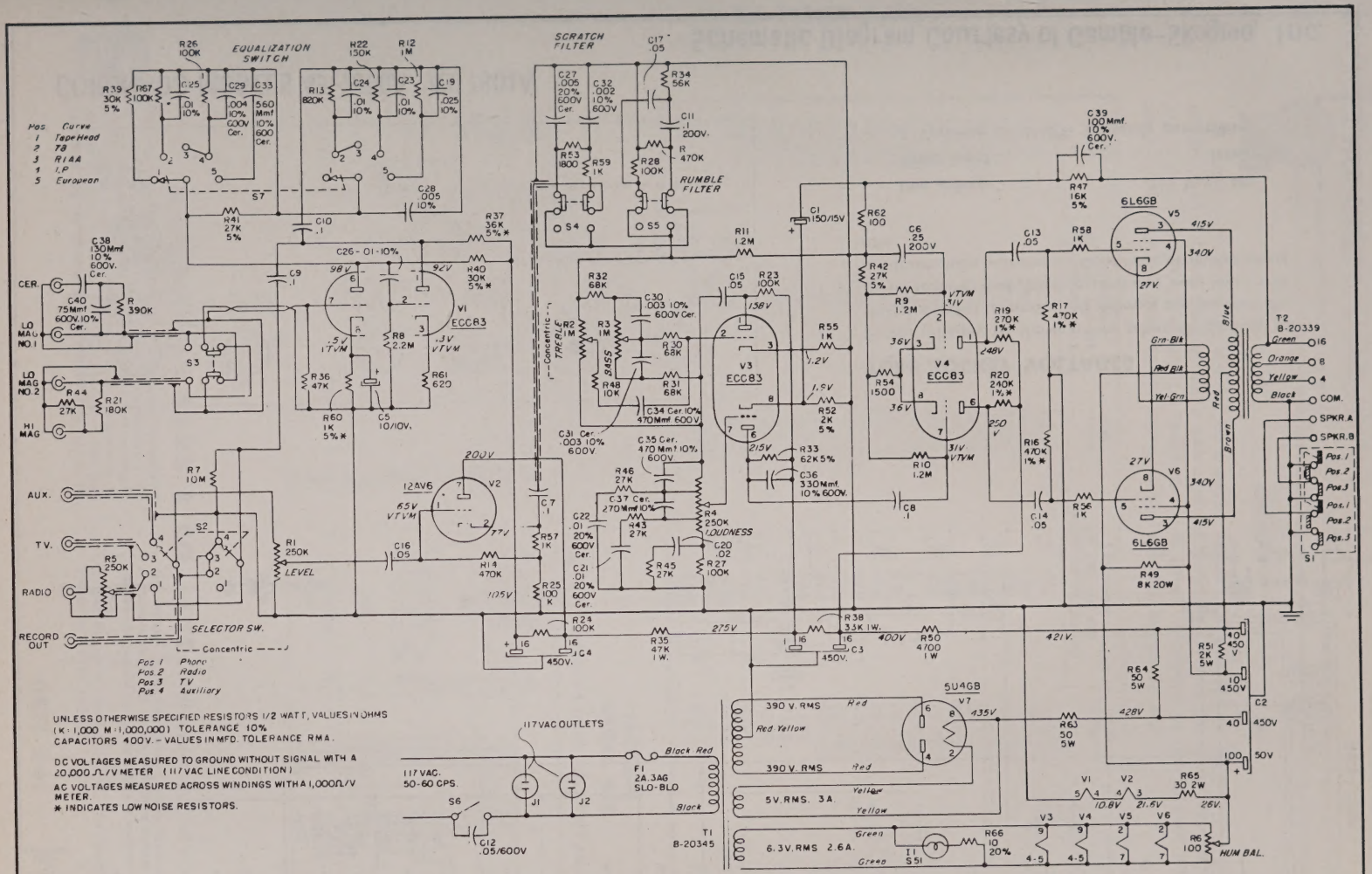


DAVID BOGEN MODEL PE3



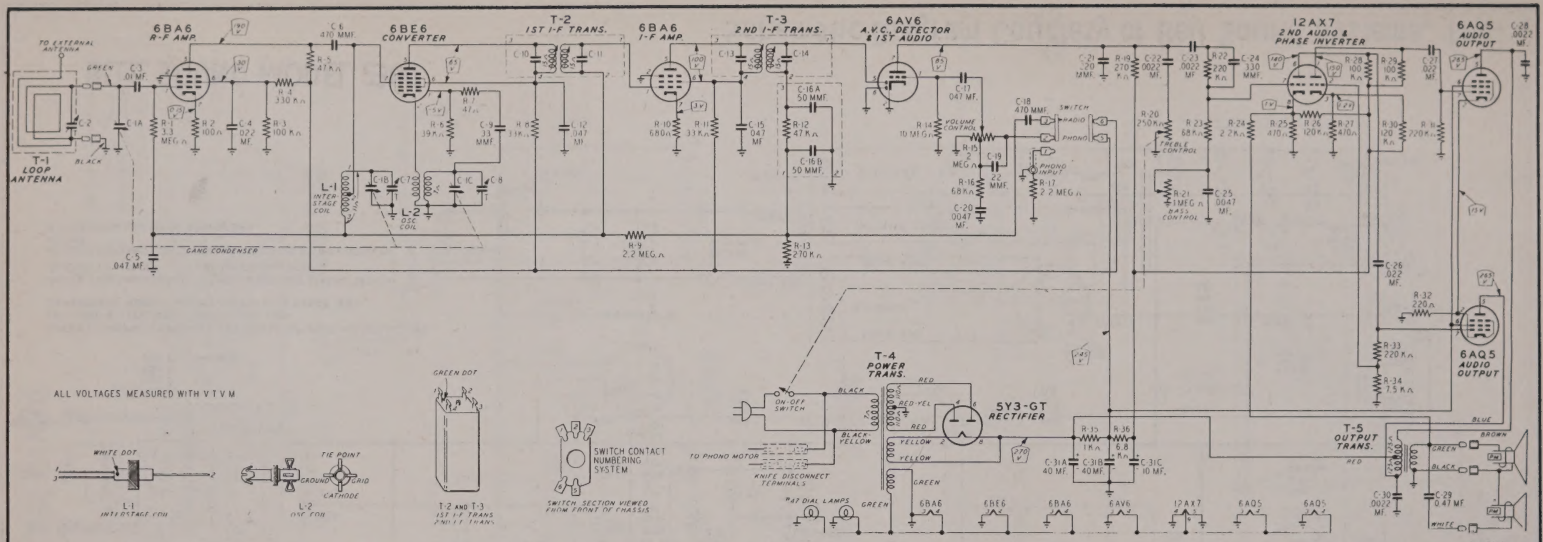
DAVID BOGEN MODEL PE5

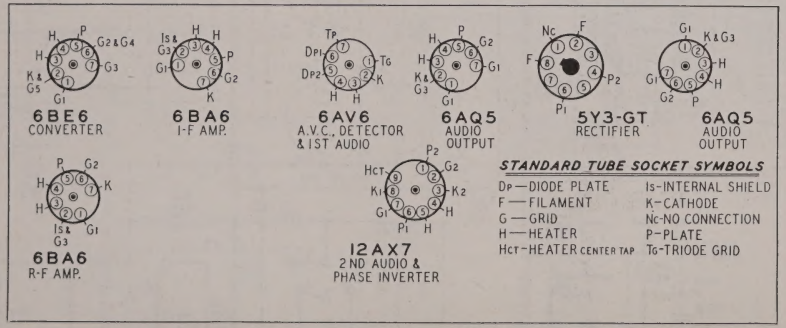
Schematic Diagrams Courtesy of David Bogen Co., Inc.



BELL SOUND MODEL 2300

Schematic Diagram Courtesy of Bell Sound Systems, Inc.





TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground and were taken with a vacuum tube volt-meter. Conditions of measurement are:

Line voltage .....117 Volts AC
Signal Input .....None
A Variation of ±10% is usually permissible.

CORONADO MODELS 43-7800A, 43-7801A

Schematic Diagram Courtesy of Gamble-Skogmo, Inc.

PHOTOFACT® Folder

INDEX

A cumulative index is included as a part of this Folder. Upon finding that a new tube is not listed on the roll chart of a tester covered in this service, refer to the latest Tube Tester Data Index to determine in which PHOTOFACT Set the data was published. If listed, reference to that Folder will provide the necessary data.

TUBE TYPES	JACKSON 598, 648, and 658 See PHOTOFACT Set No.	TUBE TYPES	JACKSON 598, 648, and 658 See PHOTOFACT Set No.	TUBE TYPES	JACKSON 598, 648, and 658 See PHOTOFACT Set No.
1H2	500	6EV7	504	10EW7	504
1N2	500	6EW7	504	12DW7	504
2ES5	500	6FA7	524	12DY8	516
2EV5	512	6FE5	500	13EM7	512
2FQ5	524	6FE8	500	14GT8	500
2FY5	512	6FG5	500	15EW6	508
3DG4	500	6FG7	516	17EW8	508
3ES5	524	6FQ5	524	19EZ8	524
3EV5	512	6FS5	520	22DE4	500
4ES8	524	6FV8	504	34GD5	508
4GS8	516	6FW5	520	35GL6	500
6AL3	524	6FW8	500	50BM8	504
6CD7	512	6FY5	508	50FE5	500
6CW7	504	6GM6	500	7167	508
6EH7	500	6GY8	504	7408	500
6EJ7	500	6HJ8	516	7543	500
6EM7	500	6HS8	524	7591	504
6EQ7	516	7DJ8	504	7695	512
6EU7	500	8ET7	516	7701	520
6EV5	500	9EF6	508	7716	520

JACKSON MODEL 598

SET 524

SUPPLEMENTS LATEST ROLL CHART 598-3

Tube Type	A.	B.	C.	Fil. Cont.	D.	E.	F.	G.
2FQ5	2.5	3Z	7	4	5	2		42
3ES5	3.0	3Z	1	4	5	2	6	44
4ES8	4.2	4ZY		5	6	7		38
	"	4ZY			1	2		38
6AL3	6.3	4	123678	5	9			16
6FA7	6.3	4		5	9	7Z	8	60
	"	4			1	7Z	8	60
	"	4			3	Z		58
6HS8	6.3	4		5	3	6Z	2	60
	"	4			8	9Z	2	60
19EZ8	19.	5Y		4	8	9Z		65
	"	5Y			6	7Z		65
	"	5Y			3	2Z		65

JACKSON MODEL 648

SET 524

SUPPLEMENTS LATEST ROLL CHART 648-24

Tube Type	Fil.	D.	E.	Plate Test
2FQ5	2.5	234	A57	21 YZ
3ES5	3.0	A234	567	34 YZ
4ES8	4.2	A123	A45	18 YZ
	"	A127	A89	18 YZ
6AL3	6.3	129	6	14 W
6FA7	6.3	128	679	42 YZ
	"	128	479	42 YZ
	"	128	3	84 X
6HS8	6.3	124679	358	70 XZ
	"	123489	AB567	70 XZ
19EZ8	19.	A12	AC67	45 YZ
	"	A12	A89	45 YZ
	"	A124	A35	45 YZ

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JACKSON
MODEL 658

SUPPLEMENTS LATEST ROLL CHART 658-4

Tube Type	Sec.	Heater	Circuit H-K	P-G	Plate	Grid Test	Heater Current
2FQ5	T	2.5H	124	a57	23R	15WY•	A10.6F Z600
3ES5	P	3.0L	123	567	38R	10WY•	A10.6E Z450
4ES8	T	4.0L	127	a89	20S	15WY•	
	T	"	123	a45	"	15WY•	A10.6L Z600
6AL3	D	6.4L	120	6	19U	V	
6FA7	T	6.4J	128	679	54S	10WY•	
	T	"	"	479	"	10WY•	
	D	"	"	3	80U	X	
6HS8	P	6.4J	124679	358	54R	10XY•	
	P	"	123489	ab567	54R	10XY•	
19EZ8	T	22.D	12	ac67	95S	8WY•	
	T	"	12	a89	95S	8WY•	
	T	"	124	a35	95S	8WY•	

CORRECTION NOTICE ON ROLL CHART 658-4 FOR MODEL 658

Tube Type	Sec.	Heater	Circuit H-K	P-G	Plate	Grid Test	Heater Current
6AJ8	T	6.4J	123	ac67	58S	10WY•	
	H	"	1239	ab458	20R	15XY•	
6CB5	P	6.4N	1248	b570	20R	95VY•	
6CB6	P	6.4J	1247	ac356	40R	10WY•	
6CD6	P	6.4N	124	ac360	18R	95VY•	
6ES8	T	6.4J	127	a89	20S	15WY•	
	T	"	123	a45	"	15WY•	
12BZ6	P	13.6E	1247	ac356	35R	15WY•	
VR75	VR	0	C1	6	52VR3	0YZ	
	St. V. 105		O.V. 70-81		Reg. 6V		
			Grid 100 Max. See instructions.				

PHOTOFACT® Folder

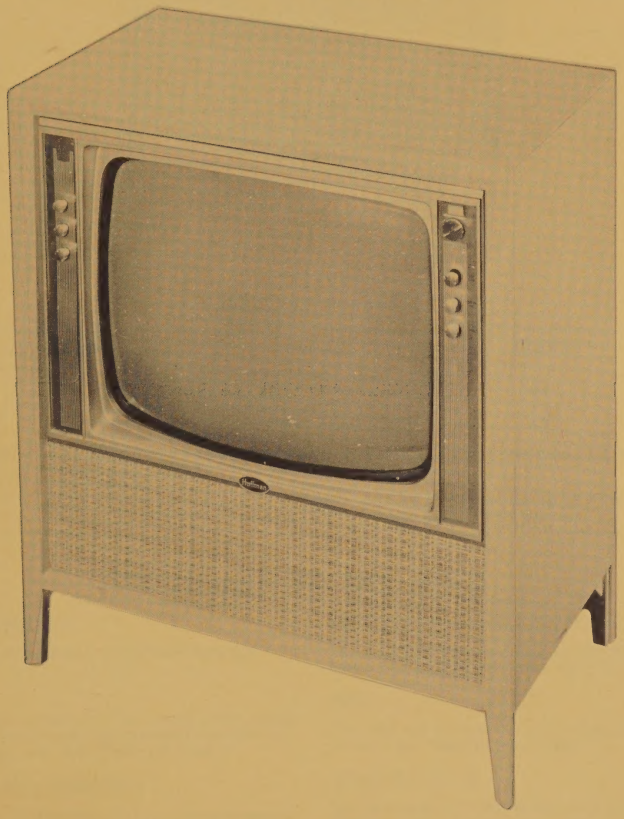
**HOFFMAN CHASSIS
356, 358**

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

HOFFMAN CHASSIS
356, 358



MODEL B3823 (CH. 356)

HOFFMAN CHASSIS
356, 358

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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MODEL B3823 (CH. 356)

TRADE NAME	HOFFMAN	MODELS	CHASSIS
		B3803, B3813, B3823, M3803, M3813, M3823, SP3803, SP3813, W3803, W3813, W3823	356
		B3833, K3843, M3833, M3853, SP3833, SP3853, W3833, W3843, W3853	358
MANUFACTURER	Hoffman Electronics Corp., Consumer Products Div., 6200 S. Avalon Blvd., Los Angeles, Calif.		
TYPE SET	Television Receiver		
TUBES	VHF - Eighteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING VHF-215 Watts, 1.9 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of the picture tube.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, it is necessary to remove the rear cover.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Horizontal Size Switch. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Control. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz Control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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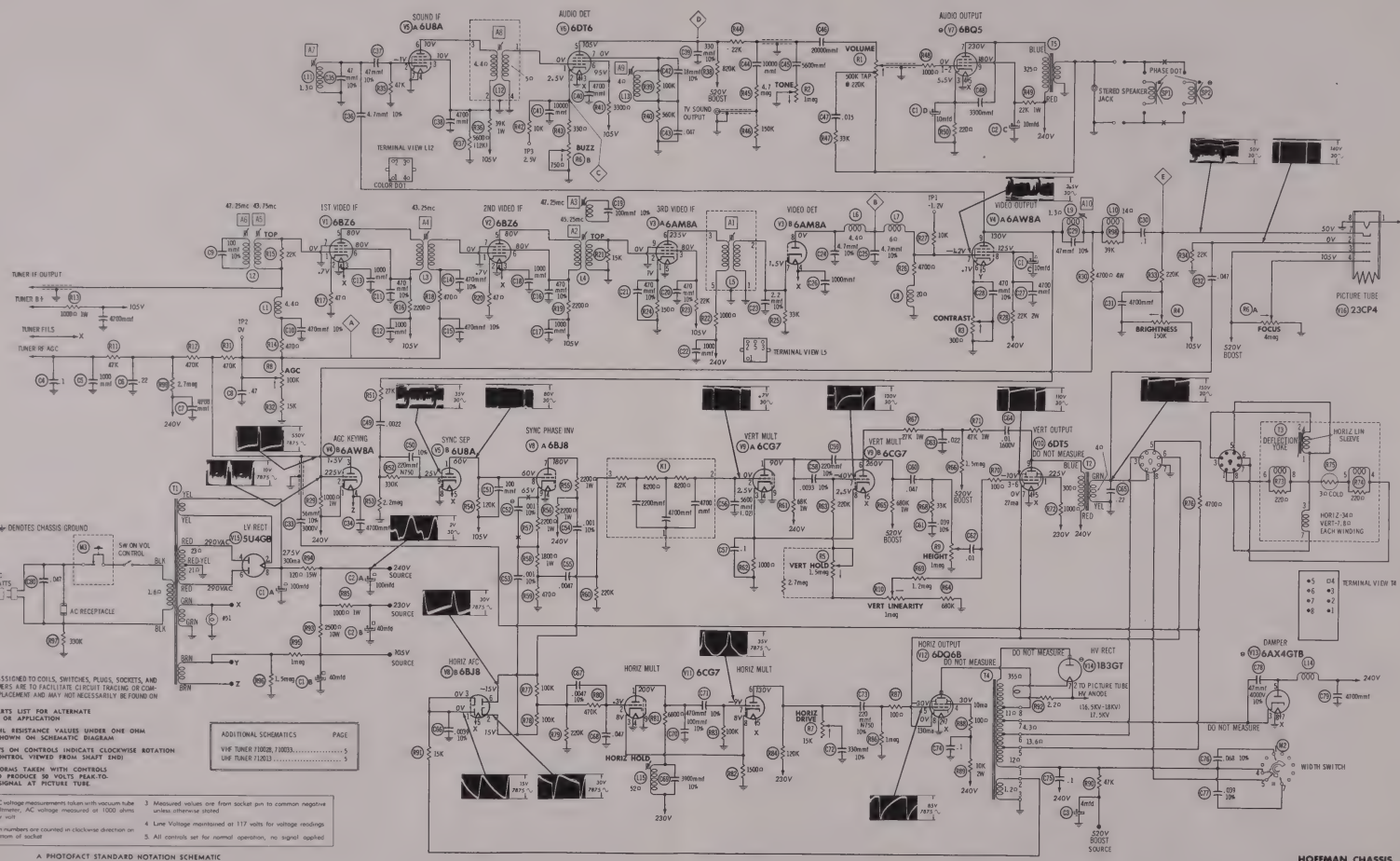
SOUND IF
V5A 6U8A
AUDIO DET
V6 6DT6
AUDIO OUTPUT
V7 6BQ5
VOLUME
TONE
PHASE DOT
STEREO SPEAKER JACK
TERMINAL VIEW L12
COLOR BOT
1ST VIDEO IF
V1 6BZ6
2ND VIDEO IF
V2 6BZ6
3RD VIDEO IF
V3 6AM8A
VIDEO DET
V3 B 6AM8A
VIDEO OUTPUT
V4 A 6AW8A
TUNER IF OUTPUT
TUNER B+
TUNER FILS
TUNER RF AGC
AGC
CONTRAST
BRIGHTNESS
FOCUS
PICTURE TUBE
V16 23CP4
AGC KEYING
V4 B 6AW8A
SYNC SEP
V5 B 6U8A
SYNC PHASE INV
V8 A 6BJ8
VERT MULT
V9 A 6CG7
VERT MULT
V9 B 6CG7
VERT OUTPUT
V10 6DT5
DO NOT MEASURE
HEIGHT
VERT HOLD
VERT LINEARITY
DEFLECTION YOKE
HORIZ LIN SLEEVE
HORIZ-340
VERT-7.8Ω
EACH WINDING
TERMINAL VIEW T8
LV RECT
V15 5U4GB
DENOTES CHASSIS GROUND
S1A ON VOL CONTROL
117VAC 220 WATTS
AC RECEPTACLE
240V SOURCE
100V SOURCE
230V SOURCE
HORIZ AFC
V8 B 6BJ8
HORIZ MULT
V11 6CG7
HORIZ MULT
HORIZ HOLD
HORIZ DRIVE
HORIZ OUTPUT
V12 6DQ6B
DO NOT MEASURE
HV RECT
V14 1B3GT
TO PICTURE TUBE HV ANODE
(16.5KV-18KV)
17.5KV
DAMPER
V13 6AX4GTB
WIDTH SWITCH
520V BOOST
520V BOOST SOURCE
DO NOT MEASURE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 710028, 710033 5
UHF TUNER 712013 5
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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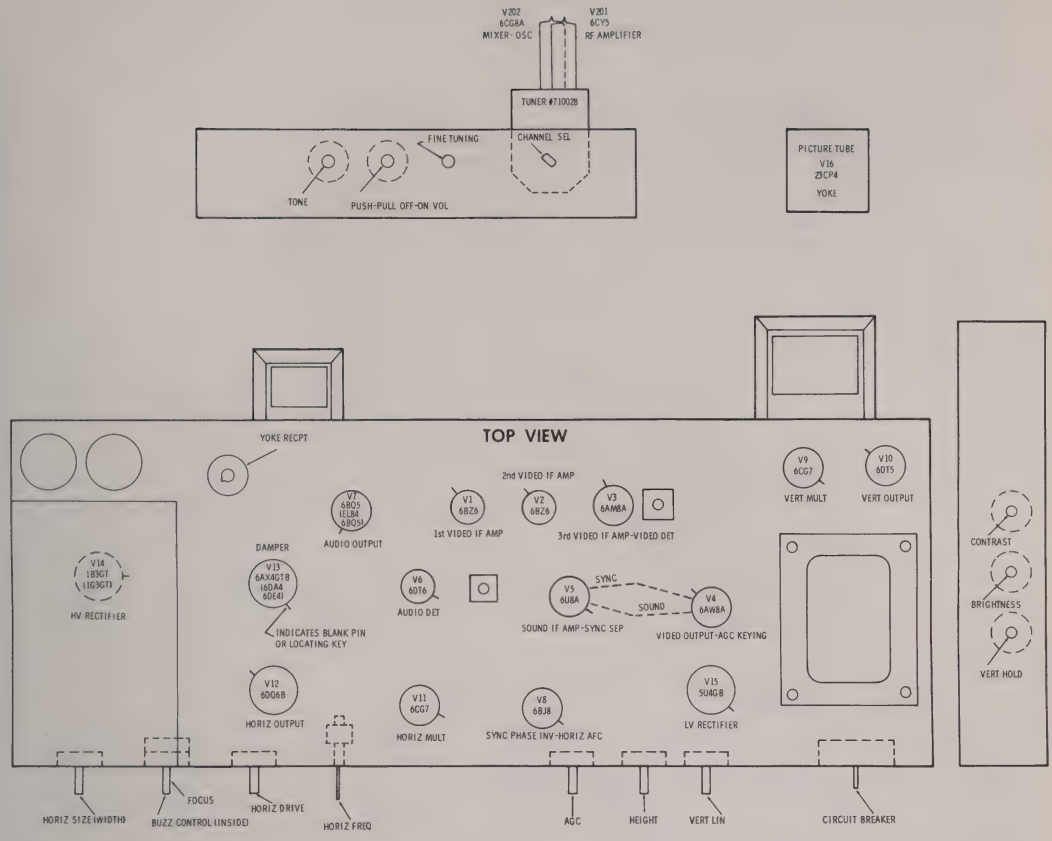
HOFFMAN CHASSIS
356, 358

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, V15

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V9
Horiz. off freq. V8, V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V16
Has pic, no sound V5, V6, V7
Overloaded picture V4

SYNC FAILURE
No vert. sync V5, V8
No horiz. sync V5, V8
No vert. or horiz. sync V5, V8

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Connect bias as under "Video IF Alignment".
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Connect a 1000mmf capacitor across VTVM and scope leads.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	43.75MC	Set Selector Between Channels	USE VTVM DC probe thru 10K to point (B). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	45.25MC	"	"	A2	"
3.	"	"	47.25MC	"	"	A3	Adjust for MINIMUM deflection.
4.	"	"	43.25MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	43.75MC	"	"	A5	"
6.	"	"	47.25MC	"	"	A6	Adjust for MINIMUM deflection.
7.	"	"	45.5MC	"	"	Mixer Plate Coil	Adjust for maximum deflection.
8.	"	44.0MC (10MC Swp)	45.0MC 45.75MC	"	Vert. Amp. thru 10K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1, A2 and A4 for desired response.

SOUND IF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	High side thru .005mfd to point (B). Low side to chassis.	4.5MC (Unmod)	Between channels	DC probe thru 10K to point (C). Common to chassis.	A7, A8	Detune A9 by turning core fully clockwise. Adjust A7 and A8 for maximum deflection. Reduce the signal generator output to keep meter reading between 3.5 and 4.5 volts at all times.
10.	"	"	"	DC probe thru 10K to point (D). Common to chassis	A9	Increase generator output to maximum and adjust A9 for MINIMUM deflection. Continue turning core counter-clockwise until meter reads from 97 to 103 volts.
11.	Tune in a TV station and if necessary, retouch A9 SLIGHTLY for undistorted sound.					

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	High side thru .005mfd to point (B). Low side to chassis.	4.5MC (Unmod)	Between Channels	RF probe to point (E). Common to chassis.	A10	Adjust for MINIMUM deflection.

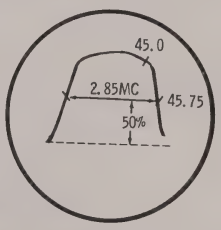
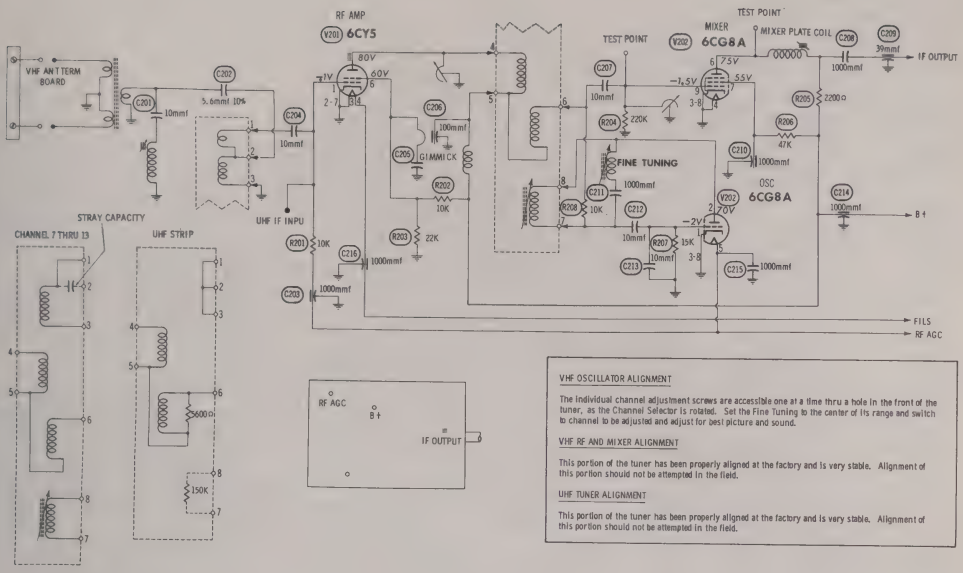


FIG. 1



VHF OSCILLATOR ALIGNMENT

The individual channel adjustment screws are accessible one at a time thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted and adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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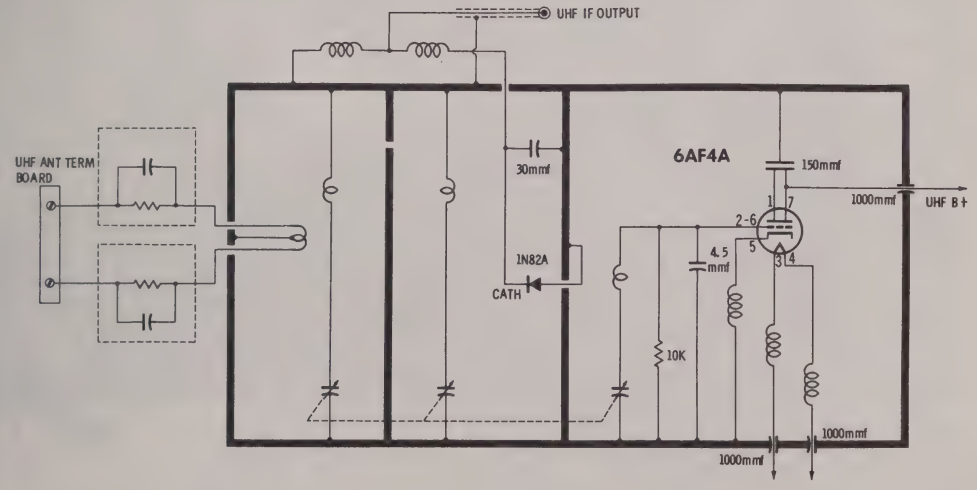
VHF TUNER 710028, 710033



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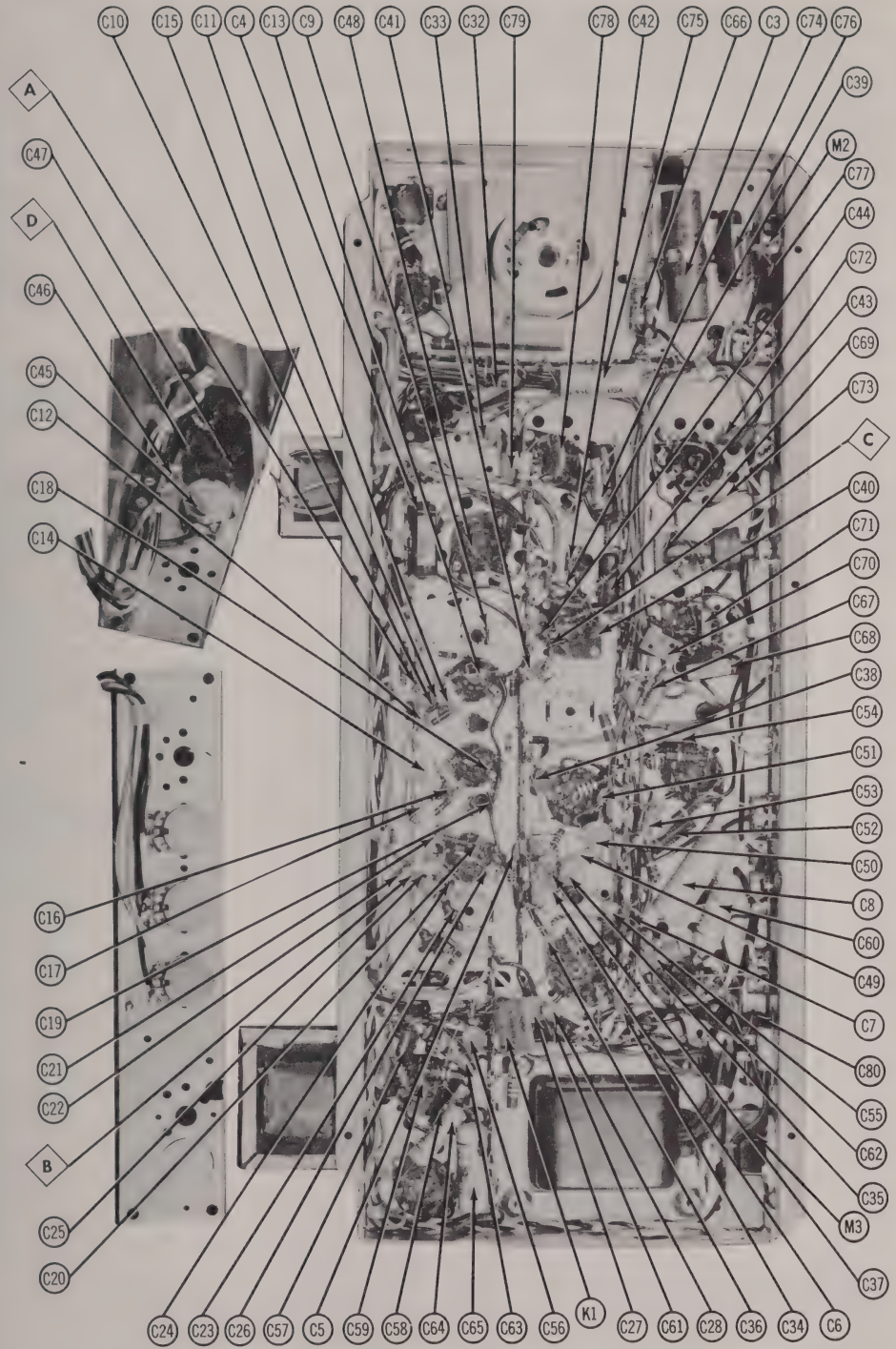
UHF TUNER 712013

SET 524 FOLDER 1

CHASSIS BOTTOM VIEW - RESISTOR, TRANS., & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

SET 524 FOLDER 1

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	1st Video IF Amp.	6DJ8
V2	2nd Video IF Amp.	6DJ8
V3	3rd Video IF Amp. -	
	Video Output - AGC Keying	6AM8A
V4	Video Output - Sync Neg.	6AW8A
V5	Sound IF Amp. - Sync Neg.	6U8A
V6	Audio Detector	6DT8
V7	Audio Output	6BQ6 (EL84/6BQ6) *
V8	Sync Phase Inv. - Horiz. AFC	6BJ8
V9	Vert. Mult.	6CQ7
V10	Vert. Output	6DT6
V11	Horiz. Mult.	6CQ7
V12	Horiz. Output	6DQ6B
V13	Damper	6AX4GTB (6DA4, 6DE4)
V14	HV Rectifier	1B3GT (1G3GT)
V15	LV Rectifier	5U4GB

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: HOFFMAN PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V16	23CP4		23CP4 ①		23CP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	400	350	857104	AFH4-05-60	D0044	FP425.6	TMQ-4310	TVL8-4635.10*	
B	240	350							
C	40	350							
D	10	350							
C2A	400	350	856914	AFH4-05-60	D0044	FP425.6	TMT-3444	TVL8-4635.10*	
B	240	350							
C	40	350							
C3	4	600	856002	PRS1845	BRHY604		TD-8-600	TVA-1962	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	.22 200V		P288N-22		CUB2P22	2DP-6-224	GEM-2022	2TM-P22
C7	4700	DD-472	BPD-0047		BYA10D47M	CCD-472	B-247	5HK-D47
C8	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C9	100 10%		1469-001	TCZ-100	22S5T1	CM-1B2-101K	MCB235	M8-31
C10	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C11	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C12	1000		BPD-001		DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	1000		BPD-001		DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C15	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C16	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C17	1000		BPD-001		DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C18	1000		BPD-001		DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	100 10%		1469-001	TCZ-100	22S5T1	CM-1B2-101K	MCB235	M8-31
C20	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C21	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C22	1000		BPD-001		DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C23	2.2 10%		NPO-SI 2.2	TCZ-2R2	CUY2C2	CCY0-2R2	CNO-522	10TCC-V22	
C24	4.7 10%		NPO-SI 4.7	TCZ-4R7	CUY4C7	CCY0-4R7	CNO-547	10TCC-V47	
C25	4.7 10%		NPO-SI 4.7	TCZ-4R7	CUY4C7	CCY0-4R7	CNO-547	10TCC-V47	
C26	1000		BPD-001		DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C27	4700		BPD-0047		DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C28	470 10%		DI-470		DD-471	S8S7T4	CCD-471	GP347	10T8-T47
C29	47 10%		DI-47		DD-470	LJ0Q47	CCD-470	GP447	10T8-Q47
C30	.1 400V		P488N-1	DF-104	CUB2P1	4DP-3-104	GEM-401	4TM-P10	
C31	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47	
C32	.047 200V		P288N-047	DD-502	CUB2S47	4DP-3-473	GEM-2047	2TM-S47	
C33	56 3000V 10%	#650112					GEM-456		
C34	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47	
C35	47 10%		DI-47	DD-470	LJ0Q47	CCD-470	GP447	10T8-Q47	
C36	4.7 10%		NPO-SI 4.7	TCZ-4R7	CUY4C7	CCY0-4R7	CNO-547	10TCC-V47	
C37	47 10%		DI-47	DD-470	LJ0Q47	CCD-470	GP447	10T8-Q47	
C38	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47	
C39	330 10%		DI-330	DD-331	LJ0T33	CCD-331	GP333	10T8-T33	
C40	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47	
C41	10000		BPD-01	DD-103	BYA10B1	CCD-103	B-110	5HK-B10	
C42	18 10%		DI-18	DD-180	LJ0Q18	CCD-180	GP418	10T8-Q18	
C43	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47	
C44	10000		BPD-01	DD-103	BYA10B1	CCD-103	B-110	5HK-B10	
C45	5600		DI-5600	DD-562		CCD-562	B-256	10T9-D56	
C46	5600		BPD-03	DD-203	BYB6S2	CCD-203	B-120	5HK-B20	
C47	.015 300V		P288N-015	DD8-153	CUB6S15	6DP-1-153	GEM-4015	6TM-S15	
C48	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33	
C49	.0022 400V		P488N-0022	D6-222	CUB6D22	6DP-1-222	GEM-622	6TM-D22	
C50	220 N750-10	220	DTN-220	CUT2S2U	CCTN-221	CN7-322	10TCU-T22		
C51	100		BPD-0001	DD-101	LJ0T1	CCD-101	GP301	10T8-T10	
C52	.001 400V 10%	Note 1	V84C8D1-10%	DD-102	CUB6D1	6DP-1-102	GEM-1621	6TM-D10	
C53	.001 400V 10%		V84C8D1-10%	DD-102	PM6D1	6DP-1-102	GEM-1621	6TM-D10	
C54	.001 400V 10%		V84C8D1-10%	DD-102	PM6D1	6DP-1-102	GEM-1621	6TM-D10	
C55	.0047 600V		P638N-0047	D6-472	CUB6D47	6DP-3-393	GEM-6247	6TM-D47	
C56	DI-5600	DD-562				CCD-562	B-256	10T8-D56	
C57	.1 200V	† (.02)	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10	
C58	.0033 400V 10%		V84C8D33-10%		CUB6D33	6DP-1-332	GEM-16233	6TM-D33	
C59	220 10%		DI-220	DD-221	LJ0T22	CCD-221	GP322	10T8-T22	
C60	.047 600V		P638N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47	
C61	.039 400V 10%		P684CM-039		DPM6S39	6DP-3-393	GEM-1614	6PS-S39	
C62	.01 600V		P638N-01	D6-103	CUB6S1	6DP-3-103	GEM-4101	6TM-S10	

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C63	.022 600V		P638N-022	DD-303	CUB6S22	6DP-3-223	GEM-6122	6TM-S22
C64	.01 1600V		P1684CM-01	DD8-103	CUB6S1	16DP-3-103	GEM-1611	MD-S
C65	.22 300V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-S22
C66	.0039 400V 10%		P684CM-0039		DPM6S39	6DP-1-392	GEM-1624	6PS-D39
C67	.0047 300V 10%		V84C3D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C68	.047 300V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C69	3900 10%		1464-0039		1N5D39	CM-2DB-392K	MC1463.5	M8-339
C70	100 10%		1469-0001	TCZ-100	22S5T1	CM-1B2-101K	MCB235	M8-31
C71	470 10%		1469-00047		5R5T47	CM-1B2-471K	MC1244	M8-347
C72	330 10%		1469-00033		5R5T33	CM-1B2-331K	MCB244	M8-333
C73	220 N750 10%	DTN-220	CUT2S2U	CCTN-221	CN7-322	10TCU-T22		
C74	.1 400V	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10		
C75	.1 600V	DF-104	CUB6P1	6DP-3-104	GEM-601	6TM-P10		
C76	.068 400V 10%		V84C4868-10%		PM4S68	6DP-4-683		4TM-S68
C77	.039 400V 10%		P684CM-039		DPM6S39	6DP-3-393	GEM-1614	6PS-S39
C78	47 4000V 10%	#650308					6DY-447	
C79	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C80	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

† Alternate Value. Note 1. May not be used in some versions. # Hoffman Part Number.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: HOFFMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	800078	BPL-91		B19-133X	PP55T254	Volume
B	250K Tap			Not Req.		SK7	Not Req.	
B	Switch			Not Req.	A47-1meg-Z	Q13-137	U53	Tone
R2A	1meg	½	800081	B-70	FS-3	Not Req.	Not Req.	
B	Shaft			Not Req.		B11-102		Contrast
R3A	300Ω	½	800076	B-2		SIK1		
B	Shaft			Not Req.		Q11-328	RU154L *	Brightness
R4A	150K	½	800079	B-42	A47-150K-S	Not Req.	BL2500	
B	Shaft			Not Req.	FS-3	Q11-138	U155	Vert. Hold
R5A	1.5meg	½	800088	B-742	A47-1.5meg-S	Not Req.	Not Req.	
B	Shaft			Not Req.	FS-3			Focus
R6A	4meg	½	802069	F1-83		† Q7-1356	★(UE4308	Buzz
B	750Ω			R2-6		B11-118	TA153L	Horiz. Drive
R7A	15K	½	800094	AB-30	A47-15K-S	TM6	Not Req.	
B	Shaft			AB-1	FS2-1/2	B11-138	PTA15L	AGC
R8A	100K	½	800038	TT-40	B47-100K-S	TM6	Not Req.	
B	Shaft			Not Req.	FS-3	B11-137	PTA1254L	Height
R9A	1meg	½	800039	TT-69	B47-1meg-S	TM4	Not Req.	
B	Shaft			Not Req.	FS-3	B11-137	PTA1254L	Vert. Linearity
R10A	1meg	½	800039	TT-69	B47-1meg-S	TM4	Not Req.	
B	Shaft			Not Req.				

"ETA-LOC" Equivalent: FA46L, RU761L, QS625, IK826.
† "CONCENTRIKIT" Equivalent: K-5 Kit with Base Elements and Shafts: B11-240, P9-021 (Panel) B11-105, RU8-008 (Rear) (Not available as a factory assembled unit).
* Use Bushing SL36.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R11	47K			
R12	470K			
R13	1000Ω 1W			
R14	470Ω			
R15	22K			
R16	2200Ω			
R17	47Ω			
R18	470Ω			
R19	2200Ω			
R20	47Ω			
R21	15K			
R22	1000Ω			
R23	22K			
R24	150Ω			
R25	33K			
R26	4700Ω			
R27	10K			
R28	22K 2W			
R29	10000 1W			
R30	4700Ω 4W	PW5-4700Ω	4G-4700Ω	#818493
R31	470K			
R32	15K			
R33	220K			
R34	22K			
R35	47K			
R36	39K 1W			
R37	9600Ω			* (12K)
R38	820K			
R39	100K			
R40	560K			
R41	3300Ω			
R42	10K			
R43	330Ω			
R44	22K			
R45	4.7meg			
R46	150K			
R47	33K			
R48	1000Ω			
R49	22K 1W			
R50	220Ω			
R51	27K			
R52	330K			
R53	2.2meg			
R54	120K			
R55	2200Ω 1W			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R56	2200Ω 1W			
R57	2200Ω 1W			
R58	1800Ω 1W			
R59	470Ω			
R60	220K			
R61	68K 1W			
R62	1000Ω			
R63	220K			
R64	680Ω			
R65	680K 1W			
R66	1.5meg			
R67	27K 1W			
R68	33K			
R69	1.2meg			
R70	100Ω			
R71	47K 1W			
R72	1000Ω			
R73	220Ω			
R74	220Ω			
R75	3Ω (Cold)			
R76	4700Ω			
R77	100K			
R78	100K			
R79	220K			
R80	470K			
R81	6800Ω			
R82	18000Ω			
R83	100K			
R84	120K			
R85	10000 1W			
R86	1meg			
R87	100K			
R88	100Ω			
R89	10K 2W			
R90	47K			
R91	15K			
R92	2.2Ω			
R93	25000 10W	PW10-2500	10W SQ 2500Ω	#825444
R94	120Ω 15W	PW15-120Ω	15W SQ 120Ω	#826005
R95	1meg			
R96	1.5meg			
R97	330K			
R98	39K			
R99	2.7meg			

* Alternate Value # Hoffman Part Number

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA
K1	Vert. Integrator	2200mmf, 4700mmf, 4700mmf, 820Ω, 820Ω, .22K	98600-2 or 98600-1	Aerovox PA-100, Centralab PC-100, Sprague V-1/V-3

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	RF Choke (27uh)	750004					① IRC Part #CLA
L2A	1st Video IF	762031	TV-134				
B	47.25MC Trap						
L3	2nd Video IF	762017	TV-130	6219	RTC-8551	T217	
L4A	3rd Video IF	762032		6222	RTC-8553	T225	
B	47.25MC Trap						
L5	4th Video IF	760019	TV-126	6234	RTC-8563	T231	
L6	RF Choke (6.5uh)	750014 ①	BC-865	4610	RTC-8520	T859	
L7	Peaking (100uh)	771008	TV-181	6112	RTC-8574	T305	
L8	Peaking (330uh)	771019	TV-207	6156	RTC-8588	T328	
L9	4.5MC Trap	762005	TV-151	1469	RTC-8602	T249	
L10	Peaking (220uh)	771013	TV-197	6154	RTC-8586	T312	
L11	1st Sound IF	762006	TV-151	1469	RTC-8602	T249	
L12	2nd Sound IF	760003	TV-113	6203	RTC-8545	T235	
L13	Quadrature	774001	TV-121	1480	RTC-8605	T251	
L14	RF Choke (1.5uh)	750015 ①	BC-863	4604	RTC-8516	T856	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L15	Horiz. Stabilizer	758020	TV-183	6211	RC110	RTC-8622	HS-5	WLC-25 T103

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ 1.9A	580VCT @ .300A DC	5V @ 3A	716020-2 or 716020				R-80BA	① Drill new mounting hole(s).
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ .45A	6.3V @ 8.7A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	728010-2						
	Alt. Output	728010						
T3	Yoke (Horiz. 18MH@ (110°) (Vert. 15MH@	790014		PCM-2017 ①②	DY-27A ①②	Y-48 ①②	Y-60-1 ①③	
	Rear Cover & Centering Device							
T4	Horiz. Output	782012						

① Remove Horizontal Damping Network. Connect same as original.
② Use original Rear Cover and Centering Device.
③ Remove 470Ω Resistor across Vertical Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	5800Ω	3-4Ω	734039	A-3019	A-8093	26849	S-5Z	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: HOFFMAN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	6-8Ω	708405 ①	6A15Z8. 4	① Used in Models W3823, M3823, D3823
SP2	6"	PM	6-8Ω	708405 ①	6A15Z8. 4	② Used in Models W3803, M3803, D3803, SP3803, W3833, M3833, D3833, SP3833, K3843, W3843
	4" x 6"	PM		708911 ②		③ Used in Models W3813, M3813, D3813, SP3813
	4" x 6"	PM		708912 ③		④ Used in Models W3853, M3853, SP3853
	8"	PM	6-8Ω	708607 ④	8A21P8	

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M1	Tuner	710028	STANDARD COIL REPLACEMENT #GG-4220-A
			VHF, Used in Chassis 356
	Tuner	710033	VHF, Used in Chassis 358
	Tuner	712013	UHF
	Switch	714001	UHF
	UHF Kit	426023	UHF Conversion
M2	Switch	902043	Width, Rotary Type
M3	Circuit Breaker	953001	

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL NO.	W3803	M3803	B3803	SP3803	W3813	M3813	B3813	SP3813	W3823	M3823	B3823	W3833	M3833	B3833	SP3833	K3843	W3843	W3853	M3853	SP3853
Mask	406019														X		X	X	X	X	X	X
Mask	406014		X		X		X		X		X		X									
Mask	406013													X		X						
Mask	406020			X		X		X		X		X			X							
Knob, Channel Selector	480072		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob, Fine Tuning, Volume	508021		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob, Contrast, Brightness, Vertical Hold, Tone	508021		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cabinet	354094																	X				
Cabinet	350009		X																			
Cabinet	354083						X															
Cabinet	352080										X											
Cabinet	354095													X								
Cabinet	354091																		X			
Cabinet	350010			X																		
Cabinet	354084							X														
Cabinet	352081											X										
Cabinet	354087														X							
Cabinet	354092																				X	
Cabinet	350011				X																	
Cabinet	354085								X													
Cabinet	352082												X									
Cabinet	354088															X						
Cabinet	350012					X																
Cabinet	354086									X												
Cabinet	354089																X					
Cabinet	354093																					X
Cabinet	354090																			X		

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	6CY5	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C202	5.6 10%							10TCC-V56
C203	1000		EF-001	MFT-1000		CCF-102	CT280A	
C204	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C205		Note 1						
C206	100		EF-0001	MFT-100				
C207	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C208	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C209	39							
C210	1000		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q10
C211	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C212	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C213	10		NPO-DI 10	DTZ-10	C10Q1C	CCD-102	CNO-410	10TCC-Q10
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	

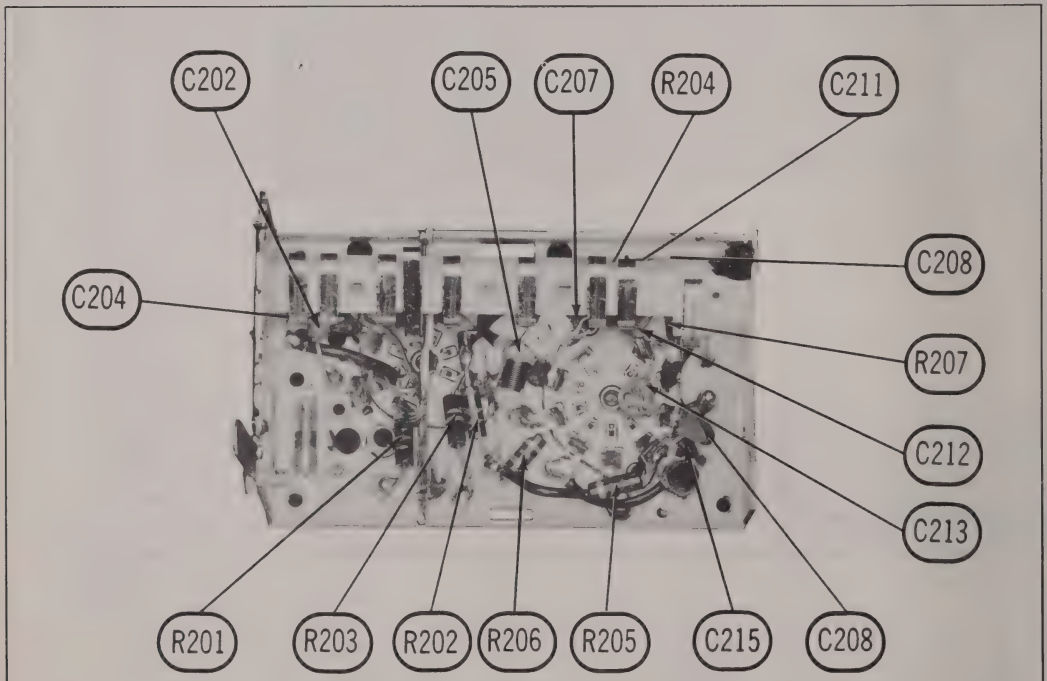
Note 1. May not be used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

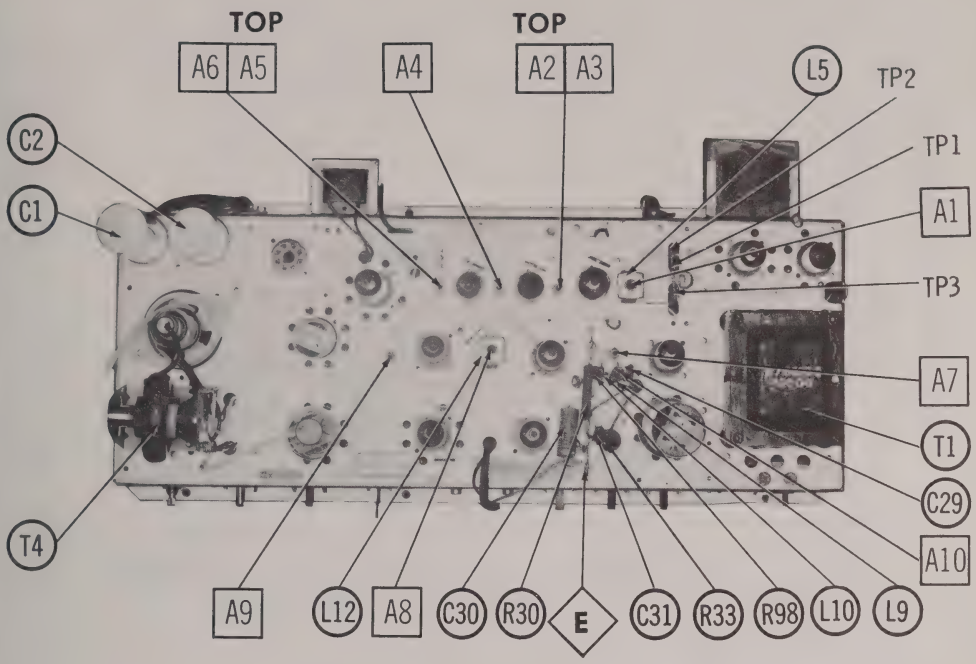
ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	10K			
R202	10K			
R203	22K			
R204	220K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R205	2200Ω			
R206	47K			
R207	15K			
R208	10K			

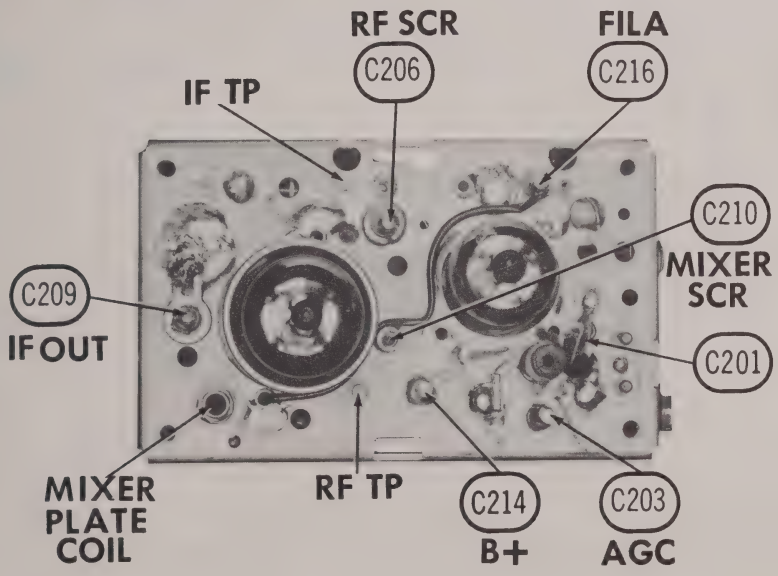


VHF TUNER 710028 BOTTOM VIEW

TP1—1.2V VIDEO OUTPUT GRID
TP2 0V IF AGC
TP3 2.5V AUDIO DET. CATHODE

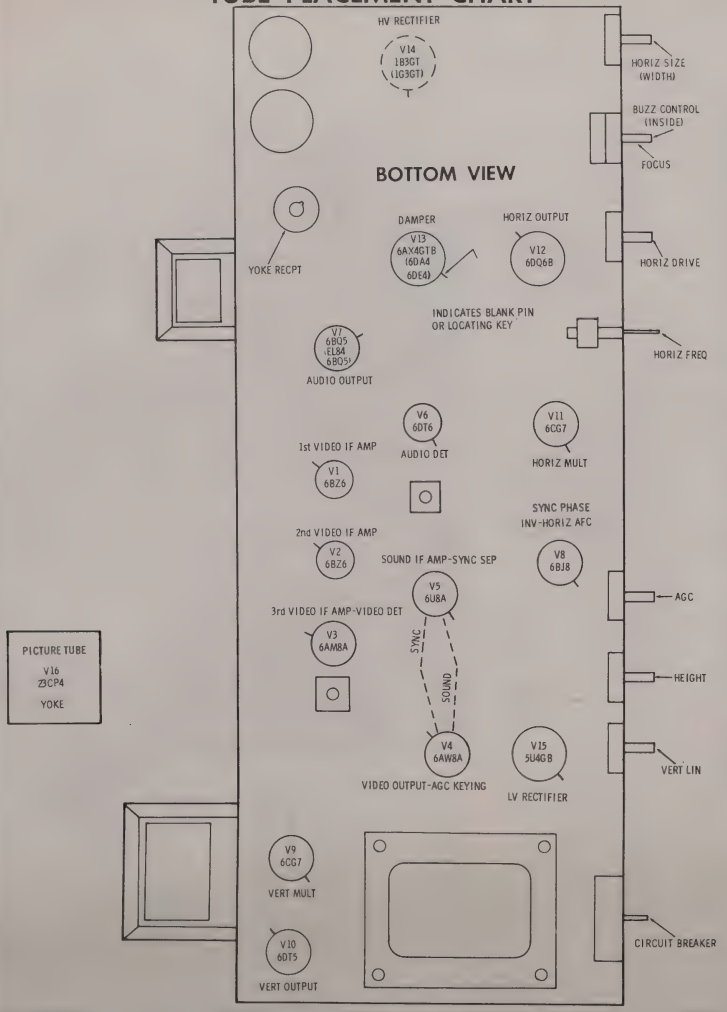


CHASSIS - TOP VIEW



VHF TUNER 710028 - TOP VIEW

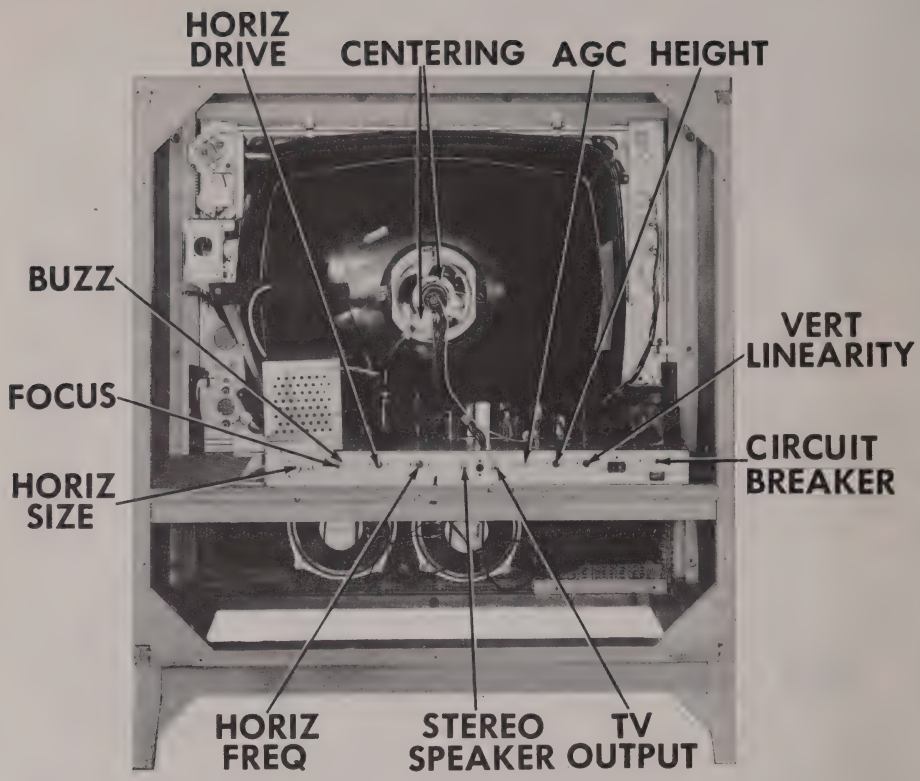
TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	• 100K	47Ω	.1Ω	0Ω	†4800Ω	†4800Ω	0Ω		
V2	6BZ6	• 100K	47Ω	.1Ω	0Ω	†4800Ω	†4800Ω	0Ω		
V3	6AM8A	150Ω	.1Ω	†24K	.1Ω	0Ω	†1100Ω	.2Ω	4700Ω	0Ω
V4	6AW8A	†120Ω	†1100Ω	• 500K	1meg	1meg	• 18Ω	4700Ω	†22K	†5800Ω
V5	6U8A	†120K	47K	†20K	0Ω	.1Ω	†20K	0Ω	0Ω	2.5meg
V6	6DT6	• 5Ω	• 800Ω	.1Ω	0Ω	‡870K	†5900Ω	560K		
V7	6BQ5	• 10K	NC	220Ω	0Ω	.1Ω	NC	†445Ω	NC	†22K
V8	6BJ8	15K	320K	15K	0Ω	.1Ω	320K	†4500Ω	†120K	4500Ω
V9	6CG7	†68K	250K	1000Ω	0Ω	.1Ω	‡600K	• 2.7meg	1000Ω	0Ω
V10	6DT5	†2100Ω	NC	• 2meg	0Ω	.1Ω	NC	0Ω	NC	†420Ω
V11	6CG7	†7900Ω	700K	1500Ω	0Ω	.1Ω	†120K	100K	1500Ω	0Ω
V12	6DQ6B	NC	0Ω	NC	†10K	1meg	TP	.1Ω	0Ω	TOP CAP ‡11Ω
V13	6AX4GTB	NC	NC	1meg	NC	†120Ω	NC	.1Ω	0Ω	
V14	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡365Ω
V15	5U4GB	NC	¶15K	NC	Z3Ω	NC	21Ω	TP	¶15K	
V16	Z3CP4	.1Ω	22K	‡47K	• ‡3meg	NC	NC	• 250K	0Ω	
V201	6CY5	1meg	0Ω	0Ω	.1Ω	†3600Ω	†14K	0Ω		
V202	6CG8A	15K	†14K	0Ω	0Ω	.1Ω	†5800Ω	†50K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 8 OF V15.
‡ MEASURED FROM PIN 3 OF V13.
NC NO CONNECTION
TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the Brightness and Contrast Controls for a normal picture.
3. Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.
4. Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.
5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the Horizontal Drive Control until white lines disappear.
6. If in step 5 the Horizontal Drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check Horizontal Sync by switching off channel and back again.

DISASSEMBLY INSTRUCTIONS

CHASSIS AND PICTURE TUBE REMOVAL

1. Remove 10 wood screws holding rear cover.
2. Remove rear cover.
3. Remove speaker leads.
4. Remove 3 chassis bolts.
5. Loosen 4 screws inside cabinet holding 4 clamps at mask (2 at top and 1 on each side).
6. Remove chassis and picture tube assembly out front.

PHOTOFACT® Folder

ZENITH CHASSIS 16F28, 16F28Q, 16F28U

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ZENITH CHASSIS 16F28, 16F28Q, 16F28U

ZENITH CHASSIS 16F28, 16F28Q, 16F28U

MODEL F3368M (TV CH. 16F28Q, REMOTE CONTROL RECEIVER S-50264)

SET 524 FOLDER 2

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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ZENITH CHASSIS 16F28, 16F28Q, 16F28U

ZENITH CHASSIS 16F28, 16F28Q, 16F28U

MODEL F3368M (TV CH. 16F28Q, REMOTE CONTROL RECEIVER S-50264)

TRADE NAME	ZENITH	MODELS
		F2858R, W; F2860M, R; F2862W ..... 16F28 F2858RU, WU; F2860MU, RU; F2862WU ..... 16F28U F3360W, Y; F3364W, Y; F3368M, R; F3370W, F3375L, F3380W, Y; F3385H ... 16F28Q
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois	
TYPE SET	Television Receiver (Remote Control Receiver S-50264 used in Models with 16F28Q TV Chassis)	
TUBES	TV: VHF - Sixteen, UHF - Seventeen	Remote Control Receiver: Eight
POWER SUPPLY	110-120 Volts AC, 60 Cycle	
RATING	TV (VHF):	190 Watts, 1.8 Amp. @ 117 Volts AC
	TV (VHF) & Remote Control Receiver:	240 Watts, 2.15 Amp. @ 117 Volts AC (280 Watts, 2.5 Amp. While Tuning)
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of the picture tube.

FUSE

TV: A 5 Amp. S/B (Line) fuse, a 7/10 Amp. S/B (B+) fuse, and a fuse wire (Fil.) are used for receiver protection. For fuse location, see "Tube Placement Chart". For fuse wire location, see M3 of "TV Chassis - Bottom View".

Remote Control Receiver: A 3/4 Amp. S/B fuse is used for receiver protection. (See "Chassis - Top View").

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, it is necessary to remove the rear cover.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart").

FOCUS

The focus may be varied by means of a Focus Control. (For location, see "Tube Placement Chart").

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart").

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz Control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart").

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the magnets so that all sides are straight.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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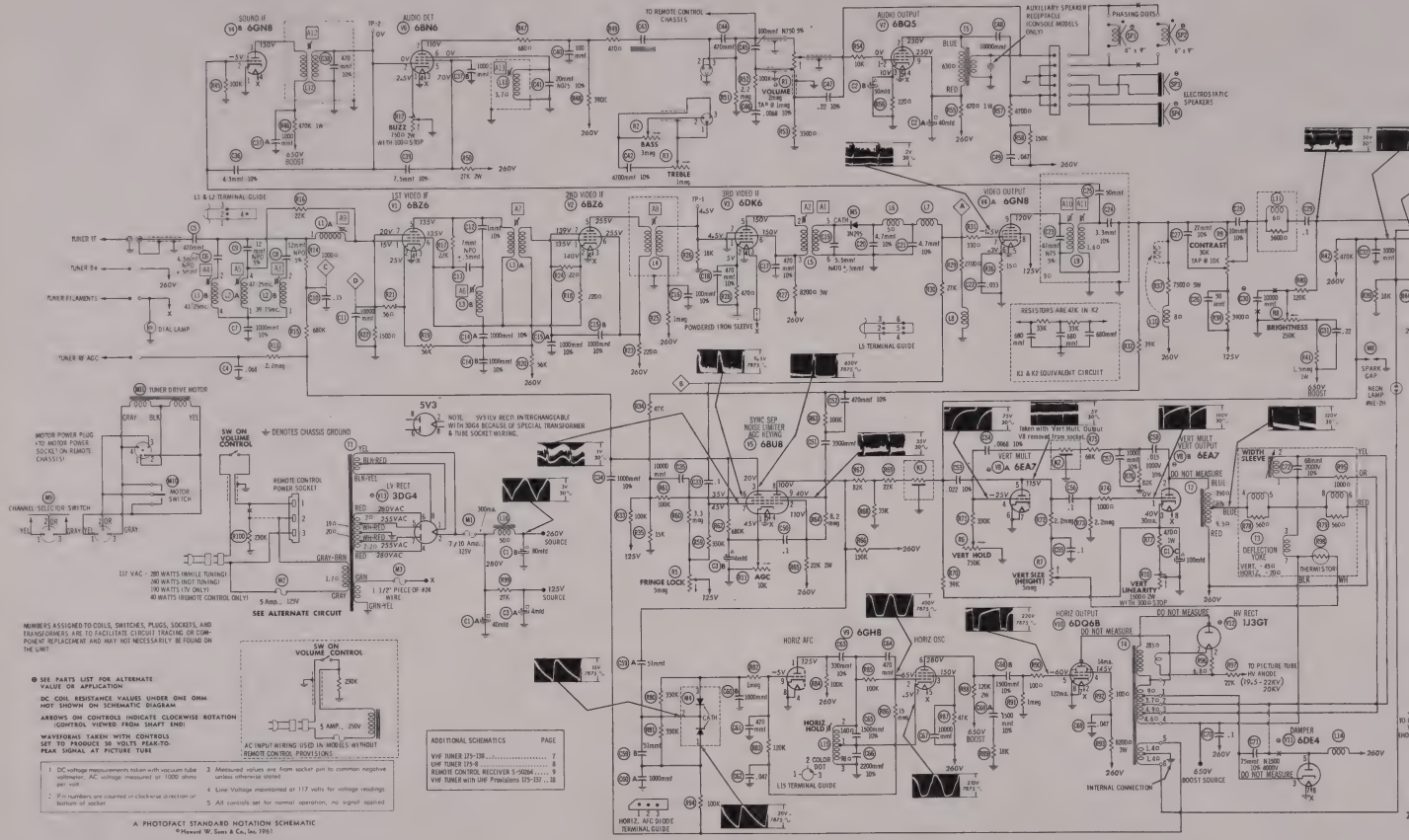
SET 524 FOLDER 2


SOUND IF
AUDIO DET
AUDIO OUTPUT
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO OUTPUT
SYNC SEP NOISE LIMITER AFC KEYING
HORIZ AFC
HORIZ OSC
HORIZ OUTPUT
HV RECT
VERT MULT
VERT OUTPUT
TUNER DRIVE MOTOR
SW ON VOLUME CONTROL
REMOTE CONTROL POWER SOCKET
SEE ALTERNATE CIRCUIT
PICTURE TUBE
23ANP4
CONTRAST
BRIGHTNESS
FOCUS
VOLUME
BASS
TREBLE
ELECTROSTATIC SPEAKERS
AUXILIARY SPEAKER RECEPTACLE (CONSOLE MODELS ONLY)
PHASING DOTS
DEFLECTION YOKE
THERMISTOR
VERT HOLD
VERT SIZE (HEIGHT)
VERT LINEARITY
WIDTH SLEEVE
FRINGE LOCK
AGC
DAMPER
INTERNAL CONNECTION
TO REMOTE CONTROL CHASSIS
TO PICTURE TUBE
TO CAP OF V12 (HV RECT.)
TO CAP OF V10 (HORIZ. OUTPUT)
HORIZ. OUTPUT TRANSFORMER
TERMINAL GUIDE
L1 & L2 TERMINAL GUIDE
L5 TERMINAL GUIDE
K1 & K2 EQUIVALENT CIRCUIT
RESISTORS ARE 47K IN K2
DO NOT MEASURE
NOTE: 5V3/1V RECT INTERCHANGEABLE WITH 3DG4 BECAUSE OF SPECIAL TRANSFORMER & TUBE SOCKET WIRING.
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
AC INPUT WIRING USED IN MODELS WITHOUT REMOTE CONTROL PROVISIONS
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction at bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 175-13B 7
UHF TUNER 175-B 8
REMOTE CONTROL RECEIVER 5-90254 9
VHF TUNER with UHF Provisions 175-13V .. 38
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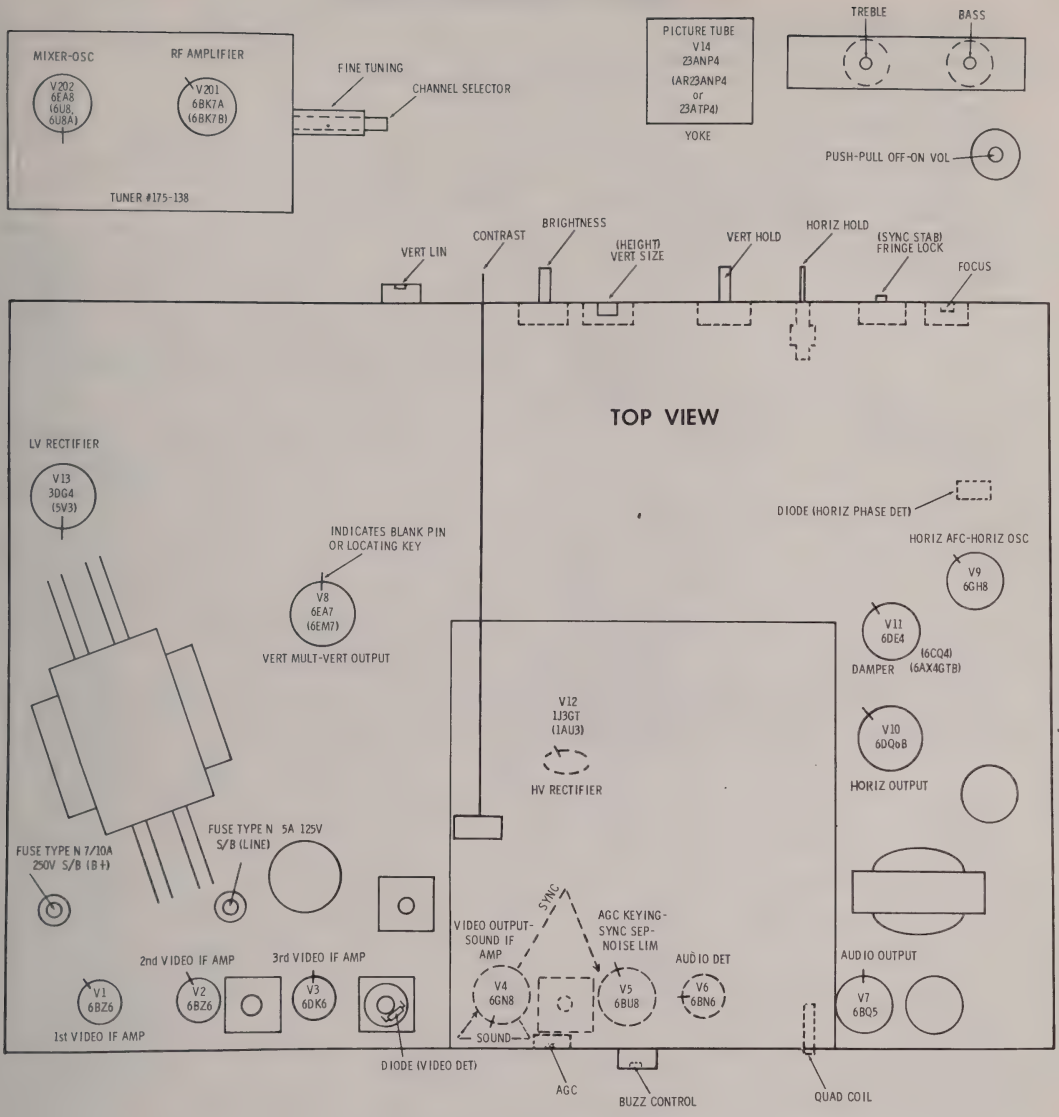
ZENITH CHASSIS 16F28, 16F28Q, 16F28U

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (Line), V13, Fuse (Fil.), Fuse (B+)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V14
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, V13
Vert. off freq. V8
Horiz. off freq. Diode (Horiz. Phase Det.), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5
No vert. or horiz. sync V5

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A13 .... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru 470mmf to TP-1. Low side to chassis. Connect a 56Ω carbon resistor across sweep output.	44MC (10MC Swp.)	39.75MC 41.25MC 45.75MC	Between any two channels	Vert. Amp. thru 10K to point (A). Low side to chassis. (Across Video Det. load.)	A1, A2	Set sweep generator output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, check to see that the cores are entering their respective windings from opposite ends of the coils.
2.	High side to ungrounded tube shield floating over Mixer-Osc. Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5, A6	Connect a clip lead from point (B) to chassis. Connect a clip lead from point (C) to point (D). Use high scope gain and adjust A3 thru A6 for MINIMUM marker amplitudes as in Fig.2. A3 controls 39.75MC marker, A4 controls 41.25MC marker, and A5 and A6 control the 47.25MC marker.
3.	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A7, A8, A9 and Mixer Plate Coil	Remove clip lead from point (D) and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A7 affects low side of curve and A8 affects the high side. Remove clip leads.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver antenna terminals. Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the Audio Detector as evidenced by a hiss similar to super-regeneration in the sound. Adjust A10, A11, A12, and A13 for maximum sound of best quality. Adjust the Buzz Control for MINIMUM buzz.
If the hiss disappears during alignment, further reduce the signal level until the hiss returns.

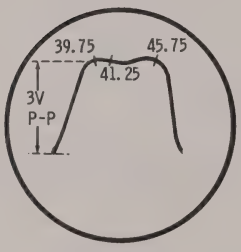


FIG.1

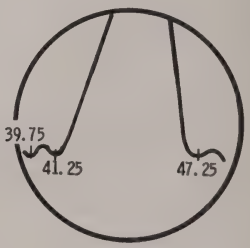


FIG.2

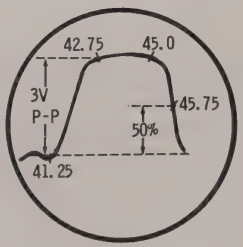
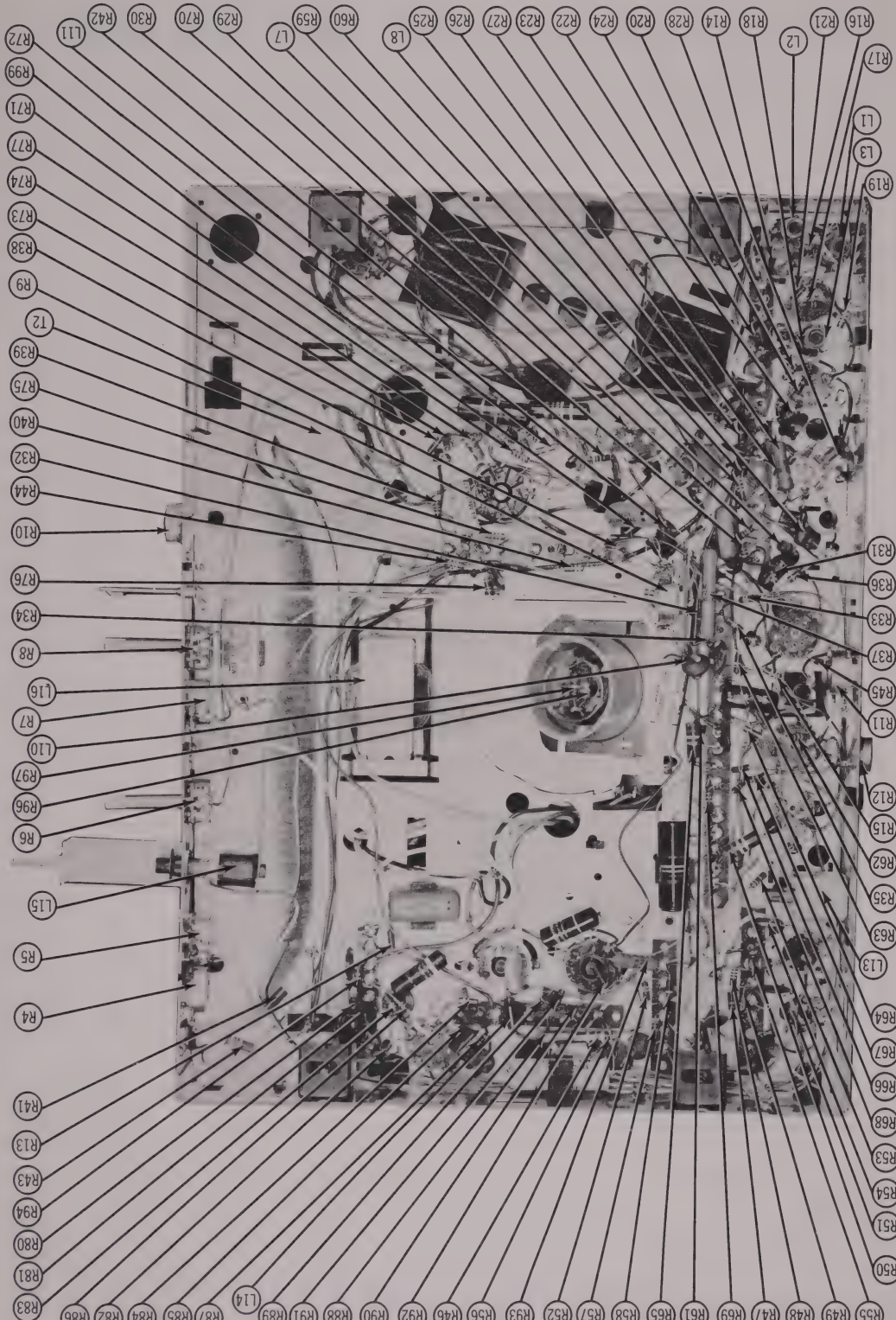
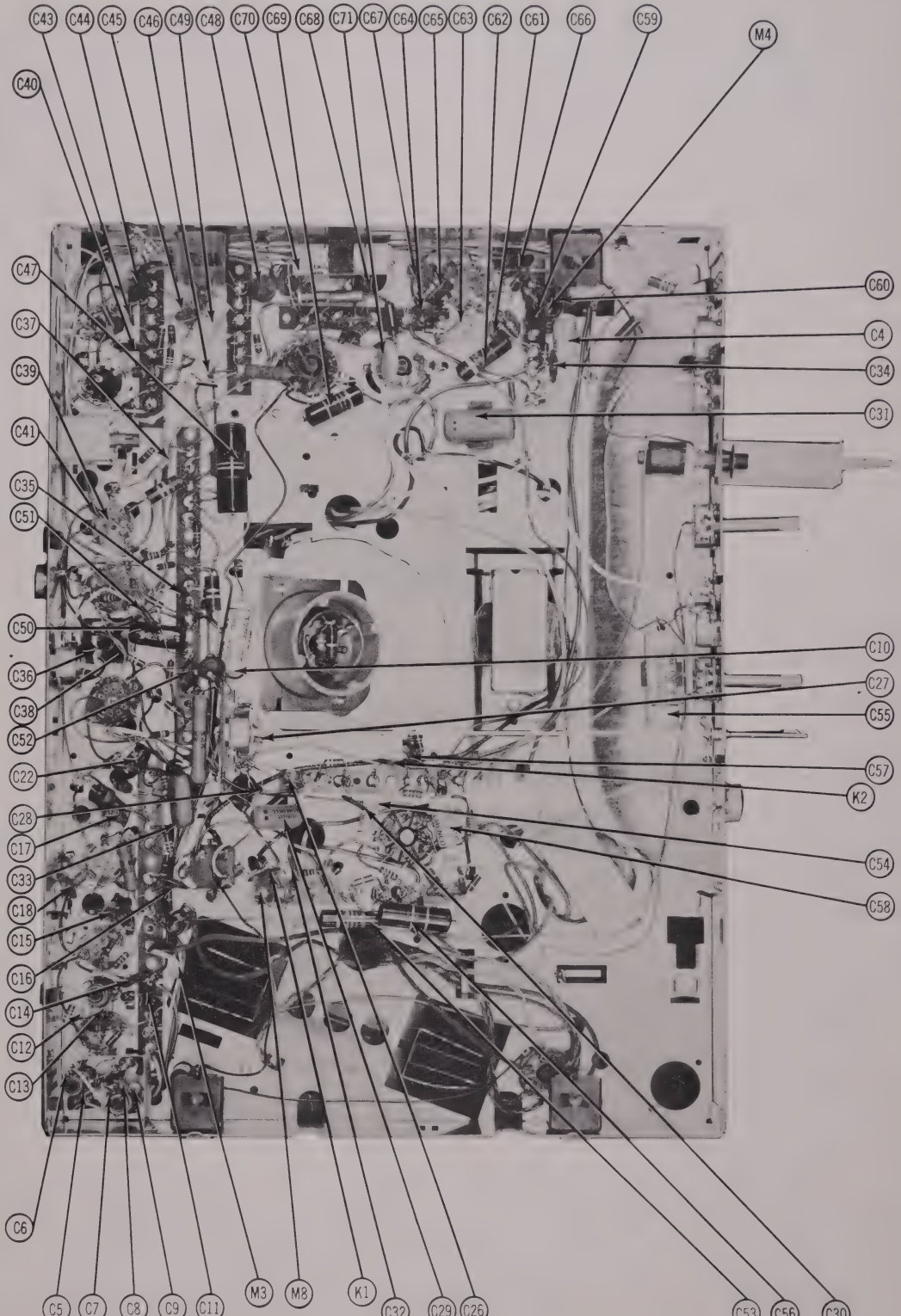


FIG.3

TV CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

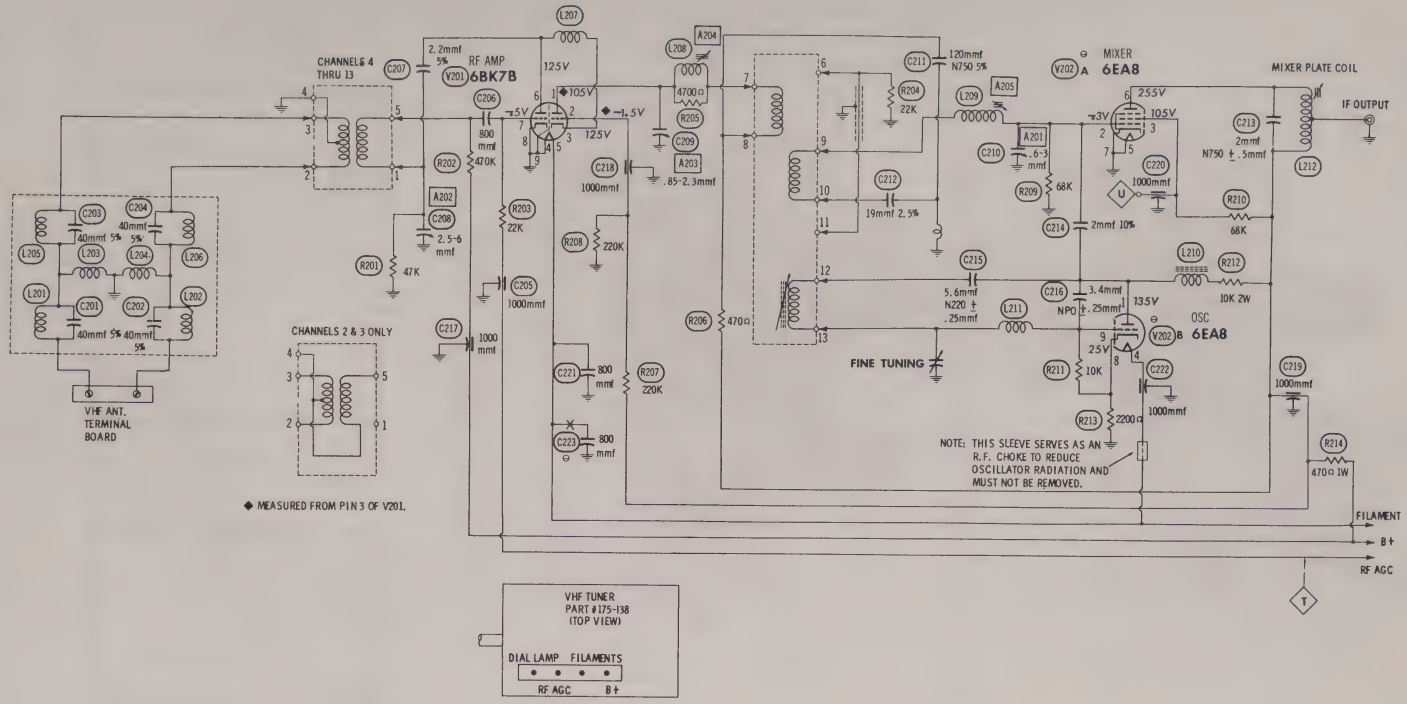




TV CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

ZENITH CHASSIS 16F28, 16F28Q, 16F28U

FOLDER 2



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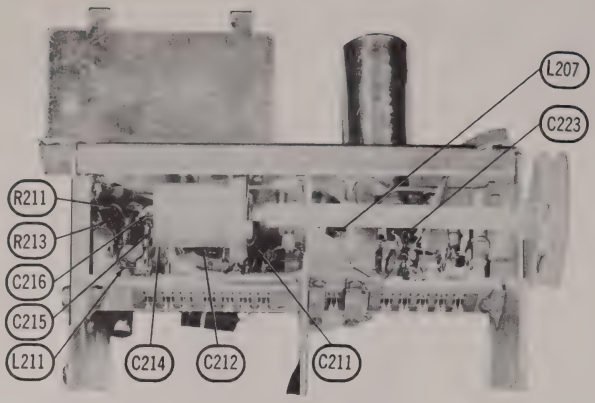
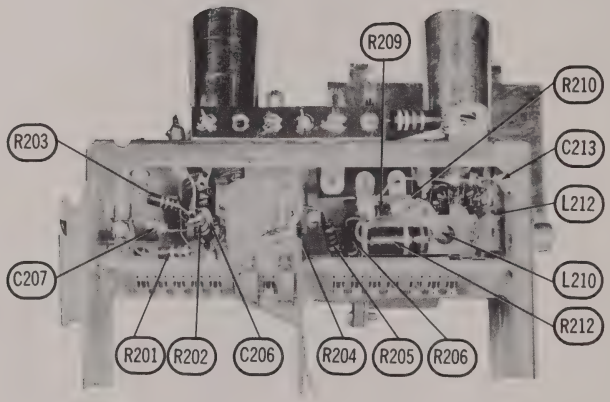
VHF TUNER 175-138

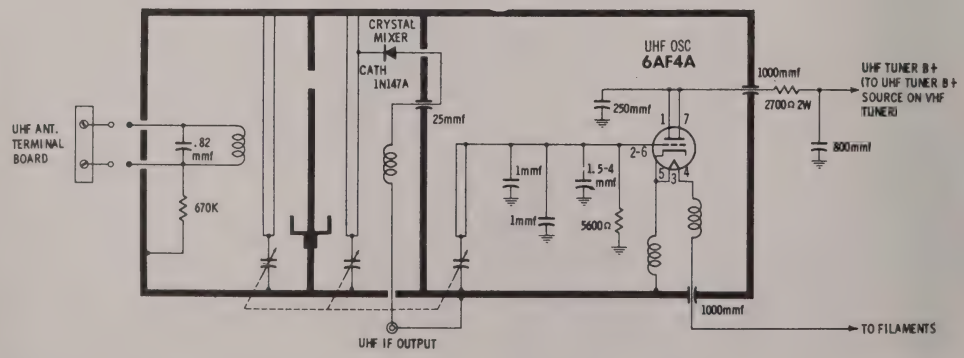
ZENITH CHASSIS 16F28, 16F28Q, 16F28U



VHF TUNER 175-138 - LEFT SIDE



VHF TUNER 175-138 - RIGHT SIDE



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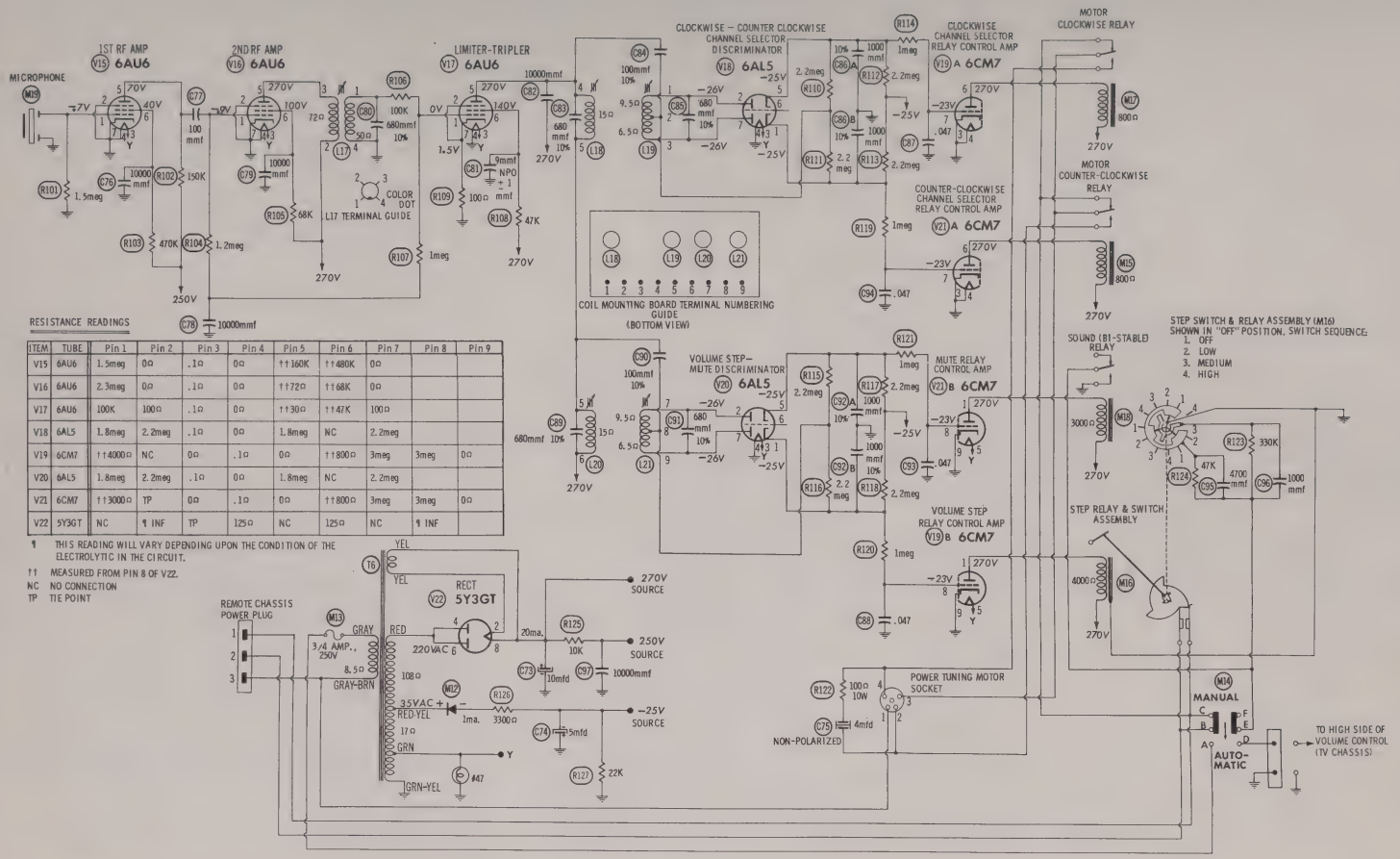
UHF TUNER 175-8



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V15	6AU6	1.5meg	0Ω	.1Ω	0Ω	††160K	††480K	0Ω		
V16	6AU6	2.3meg	0Ω	.1Ω	0Ω	††72Ω	††68K	0Ω		
V17	6AU6	100K	100Ω	.1Ω	0Ω	††30Ω	††47K	100Ω		
V18	6AL5	1.8meg	2.2meg	.1Ω	0Ω	1.8meg	NC	2.2meg		
V19	6CM7	††4000Ω	NC	0Ω	.1Ω	0Ω	††800Ω	3meg	3meg	0Ω
V20	6AL5	1.8meg	2.2meg	.1Ω	0Ω	1.8meg	NC	2.2meg		
V21	6CM7	††3000Ω	TP	0Ω	.1Ω	0Ω	††800Ω	3meg	3meg	0Ω
V22	5Y3GT	NC	¶ INF	TP	125Ω	NC	125Ω	NC	¶ INF	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V22.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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REMOTE CONTROL RECEIVER S-50264

ZENITH CHASSIS 16F28, 16F28Q, 16F28U

TUNER PARTS LIST AND DESCRIPTIONS

175-138

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •		• RAYTHEON •	SYLVANIA •	
V201	RF Amplifier	6BK7A (6BK7B)*	V202	Mixer - Osc.	6EA8 (6U8)* (6U8A)*

* Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C202	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C203	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C204	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	800		BPD-0008	DD-801	L10T8	CCD-821	B-382	5GA-T80
C207	2.2 5%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C208	2.5-6	#22-2221		829-6		CV-3	CT552	
C209	.85-2.3	#22-2453		829-3		CV-1	CT565	
C210	.6-3.0	#22-2504		829-3		CV-1	CT565	
C211	120 N750 5%			TCN-120	C10T12U	CCTN-121	CN7-312	10TCU-T12
C212	19 2.5%		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-418	10TCC-Q20
C213	2 N750 ± .5mmf						CN7-522	10TCU-V22
C214	2 10%		NPO-SI 2.0	TCZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C215	5.6 N220 ± .25mmf	#22-2499				*		10TCR-V56
C216	3.4 NPO ± .25mmf		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	
C221	800		BPD-0008	DD-801	L10T8	CCD-821	B-382	5GA-T80
C222	1000		EF-001	MFT-1000		CCF-102	CT280A	
C223	800	Note 1	BPD-0008	DD-801	L10T8	CCD-821	B-382	5GA-T80

Zenith Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. May not be used in some versions.

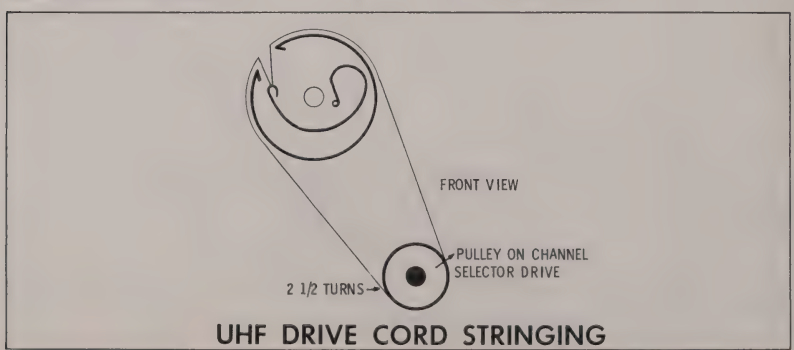
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R208	220K			
R202	470K				R209	68K			
R203	22K				R210	68K			
R204	22K				R211	10K			
R205	4700Ω				R212	10K 2W			
R206	470Ω				R213	2200Ω			
R207	220K				R214	470Ω 1W			

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES	ITEM No.	USE	ZENITH PART No.	NOTES
L201	Ant. Coil	20-490		L207	RF Choke	20-431	
L202	Ant. Coil	20-490		L208	RF Plate Coil	20-537	
L203	Ant. Coil	20-505		L209	Mixer Grid Coil	20-538	
L204	Ant. Coil	20-505		L210	RF Choke	S-18859	
L205	Ant. Coil	20-490		L211	RF Choke	20-541	
L206	Ant. Coil	20-490		L212	Mixer Plate Coil	S-45230	



UHF DRIVE CORD STRINGING

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6	V7	Audio Output	6BQ5
V2	2nd Video IF Amp.	6BZ6	V8	Vert. Mult. - Vert. Output	6EA7 (6EM7) *
V3	3rd Video IF Amp.	6DK6	V9	Horiz. AFC - Horiz. Osc.	6GH8
V4	Video Output - Sound IF Amp.	6GN8	V10	Horiz. Output	6DQ6B
V5	AGC Keying - Sync Sep. - Noise Limiter	6BU8	V11	Damper	6DE4 (6CQ4, 6AX4GTB) *
V6	Audio Detector	6BN6	V12	HV Rectifier	1J3GT (1AU3) *
			V13	LV Rectifier	3DG4 (5V3) *

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	ZENITH PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V14	23ANP4 〈AR23ANP4〉 or 23ATP4				23ANP4 ① 〈23ATP4 ①〉	① Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▪40	400	22-3137	AFH4-57-93	C0890	FP333.2	TMT-3480	TVL-4663.4	
B	▪80	400							
C	▲100	50							
C2A	▪40	450	22-3162	AFH2-89-50	B0652	FP229.53		TVL-2708.8	
B	▲50	25							
C3A	▪4	350	22-3201	AFH2-46	B0362	WP230.9	TMD-2600	TVL-2748	
B	▲4	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.068	200V			P288N-068		CUB6S68	4DP-3-683	GEM-4168	4TM-S68
C5	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C6	4.5	NPO	±.5mmf		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C7	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C8	12	NPO	5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-V12
C9	12	NPO	5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-V12
C10	.15	200V			P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C11	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	1		10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C13	7	NPO	±.5mmf		NPO-DI 6.8	DTZ-6R8	C10V7C	CCTO-6R8	CNO-568	10TCC-V68
C14A	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
B	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C15A	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
B	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C16	100		10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C17	470		10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C18	470		10%		DI-470	DD-471	5R5T47	CCD-471 *	GP347	10TS-T47
C19	5.5	N470	±.5mmf	#22-3221						
C20	4.7		10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C21	4.7		10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C22	.033	200V			P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S22
C23	47	N75	5%	#22-2467				*		
C24	3.3		10%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C25	50				SI 50	D6-500	L10Q50	CCD-500	GP450	10TS-Q50
C26	50				SI 50	D6-500	L10Q50	CCD-500	GP450	10TS-Q50
C27	27		10%		NPO-SI 27	D6-270	L10Q27	CCD-270	GP427	10TS-Q27
C28	10		10%		NPO-SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C29	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C30	10000			Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	.22	600V			P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22
C32	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C33	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C34	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C35	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	4.3		10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C37A	1000		15%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
B	1000		15%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C38	470		10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C39	7.5		10%	#22-2742						
C40	100				BPD-0001	DD-101	L10T1	CCD-101 *	GP310	10TS-T10
C41	20	N075	10%	#22-3139						
C42	4700		10%		DI-4700		PM6D47	CCD-472	JL-247	10TS-D47
C43	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C45	100	N750	5%			DTN-100	C10T1U	CCTN-101	CNT-310	10TCU-T10
C46	.0068	200V	10%		V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C47	.22	200V	10%		V84C2P22-10%		PM2P22	2DP-4-224		2TM-P22
C48	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C50	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C51	3300				BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C52	470		10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C53	.022	400V	10%		V84C4S22-10%		PM4S22	4DP-2-223	GEM-1612	4TM-S22
C54	.0068	200V	10%		V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C55	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C56	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C57	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C58	.015	1000V	10%		P1084CM-018		DPMS10S15	16DP-4-153		10TM-S15

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C59A	5		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
B	5		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C60A	1000 10%		DI-1000	DD-102	5HS1H	CCD-102	GP210	10TS-D10
B	1000 10%		DI-1000	DD-102	5HS1H	CCD-102	GP210	10TS-D10
C61	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C62	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C63	330 10%		[illegible]		5HS733	CM-19B-331K	MICE341	MS-333
C64	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C65	1500 10%		1464-0015		5HS1D5	CM-19B-152K	MCB456	MS-215
C66	2200 10%		1464-0022		1HS222	CM-19B-222K	MCJ459	MS-222
C67	10000		BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-S10
C68A	1500 10%		DI-1500	DD-152	5HS1D5	CCD-152	GP215	10TS-D15
B	1500 10%		DI-1500	DD-152	EH2H15	CCD-152	GP215	10TS-D15
C69	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C70	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C71	75 4000V NPO 10%							
C72	68 2000V 10%				HVA20Q68		2HY-468	

Note 1: May not be used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Zenith Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA: ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS—IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
	RESIST ANCE	WATTS						
R1A	5meg 1meg Tap	½	63-4659 ①	BPL-S2		B1S-139X †	PP26T16	Volume
B	Shaft			Not Req.		Not Req.	D8-37	
C	Switch			Not Req.		8K3 †	Not Req.	
R2A	5meg	½	63-4591	AB-S65		B1T-140		Bass
B	Shaft			AK-33		8K3		
R3A	1meg	½	63-4499	AB-T0	A47-1meg-Z	B1S-137	U53	Treble
B	Shaft			AK-33	R3-3/16	8K3	D8-37	
R4	5meg	½	63-4455	TT-94	B47-5meg-S	8LC3	HJ-59	Focus
R5A	5meg	½	63-4013	AB-S8	B47-5meg-S	B1S-141	U58	Fringe Lock (Sync Stab.)
B	Shaft			AK-1	Not Req.	TM4	Not Req.	
R6A	750K	½	63-4496	B-96	A47-750K-S	Q1L-136	U54	Vert. Hold
B	Shaft			Not Req.	K36-3	Not Req.	Not Req.	
R7	5meg	½	63-4660	TT-97	B47-5meg-S	8LC3	PTA56L	Vert. Size (Height)
R8A	250K	½	63-4497	B-81	A47-250K-Z	Q1S-130	U44	Brightness
B	Shaft			Not Req.	K36-3	Not Req.	Not Req.	
R9	30K 10K Tap	½	63-4489					Contrast
R10	1500Ω 300Ω Stop	2(WW)	63-4620	WW-152 *	B9-1500 *	B1U-152 *	113-1500 *	FL-1.5K *	Vert. Linearity
R11A	10K	½	63-4006	TT-74	B47-10K-S	B1U-118	TA141	AGC
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R13	750Ω 100Ω Stop	2(WW)	63-3284	WN-751 **	B9-800 **	113-850 **	FL-750 **	Buss Control

① Model F-3360W uses 1 meg Volume (Part #63-4661).
† Factory Assembled Part #PPQ85-139X (8KB).
* Use 270Ω 2W Series Resistor.
** Use 100Ω 2W Series Resistor.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No	WORKMAN TV PART No	REMARKS
R13	2.2meg			
R14	1000Ω			
R15	680K			
R16	22K			
R17	22K			
R18	220Ω			
R19	56K			
R20	56K			
R21	56Ω			
R22	1500Ω			
R23	220Ω			
R24	22Ω			
R25	1meg			
R26	18K			
R27	8200Ω 3W	PW5-8200Ω	3G-8200Ω	#63-4098
R28	470Ω			
R29	2700Ω			
R30	27K			
R31	330Ω			
R32	39K			
R33	100K			
R34	47K			
R35	15K			
R36	15Ω			
R37	7500Ω 5W	PW5-7500Ω	5G-7500Ω	#63-4055
R38	3900Ω			
R39	18K			
R40	130K			
R41	1.5meg 1W			
R42	470K			
R43	470K 1W			
R44	18K			
R45	100K			
R46	470K 1W			
R47	680Ω			
R48	390K			
R49	470Ω			
R50	27K 2W			
R51	2.2meg			
R52	100K			
R53	3350Ω			
R54	10K			
R55	470Ω 1W			
R56	220Ω			
R57	4700Ω			
R58	150K			
R59	330K			
R60	3.3meg			
R61	100K			
R62	680K			
R63	100K			
R64	8.2meg			
R65	22K 2W			
R66	150K			
R67	82K			
R68	33K			
R69	22K			
R70	39K			
R71	330K			
R72	2.2meg			
R73	2.2meg			
R74	1000Ω			
R75	68K			
R76	82K			
R77	470Ω 1W			
R78	560Ω			
R79	8800Ω			
R80	330K			
R81	330K			
R82	1meg			
R83	120K			
R84	100K			
R85	100K			
R86	15meg			
R87	47K			
R88	120K 2W			
R89	18K			
R90	100Ω			
R91	1meg			
R92	100Ω			
R93	8200Ω 3W	PW5-8200Ω	3G-8200Ω	#63-4098
R94	100K			
R95	1000Ω			
R96	6.8Ω			
R97	22K 1W			#63-4726
R98	①			
R99	27K 2W			
R100	230K			

Zenith Part Number.
① Part of T3.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION *	ZENITH PART No.	REPLACEMENT DATA
K1	Vert. Integrator		87-5	Centralab PC-407 Sprague V-15
K2	Vert. Feedback		87-4	Centralab PC-408 Sprague V-14

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1A	1st Video IF	S-48045 ①					① Complete Assembly Part #S-49594.
B	41.25MC Trap						② Complete Assembly Part #S-49883.
L2A	47.25MC Trap	S-41883					③ Complete Assembly Part #S-49584.
B	39.75MC Trap						④ Complete Assembly Part #S-46741.
L2A	2nd Video IF	S-41889 ②					⑤ Complete Assembly Part #S-47967.
B	47.25MC Trap						⑥ Complete Assembly Part #S-49582.
L4	3rd Video IF	S-46740 ③					⑦ Wound on 5600Ω Resistor.
L5	4th Video IF	S-47968 ④					† Part of L6 Assembly (#S-47967).
L6	Peaking (90uh)	S-41879 †	TV-181	6177	RTC-8594	T304	* Parallel with 5600Ω Resistor.
L7	RF Choke (6uh)	S-2888 †	BC-665	4610	RTC-8520	T859	
L8	Peaking (170uh)	S-43619	TV-184	6180	RTC-8597	T310	
L8A	4.5MC Trap	S-43125 ⑤					
B	1st Sound IF						
L10	Peaking (250uh)	S-18011	TV-185	6181	RTC-8598	T315	
L11	Peaking (170uh)	S-43618 ⑥	TV-184 *	6180 *	RTC-8597 *	T310 *	
L12	2nd Sound IF	S-41899 ⑦					
L13	Quadrature	S-47702	TV-12L	1480	RTC-8605	T251	
L14	RF Choke (10uh)	S-22777	BC-986	4613	RTC-8522	T960	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L15	Horiz. Osc.	S-47150							

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 (~)	REPLACEMENT DATA: ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L16	.290A	50Ω	1.4 Hy.	95-1559	C-2996	C-3336 ①	26C44	C-29X	① Drill new mounting hole(s).

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ① 1.8A	560VCT Tap ② 510VCT .300A	5V Tap ② 3V ④ 4.5A	95-1726					
	SEC. 3	6.3V ③ 8.5A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Merit PART No.	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No.	NOTES
T2	Vert. Output	95-1656	A-3033 ①	VO-38	A-8148 ①	Y-39 ⑤	A-13X	
T3	Yoke (Horiz. 13MH) (92°) (Vert. 45MH)	95-1766 *	MDF-91 ②③④⑤		DY-13A ②③④⑤		Y-40 & NW3 ④⑤	
	Rear Cover and Centering Device	S-43091 or S-23237						
T4	Horiz. Output	S-49918					D-201	

* Includes rear cover and centering device.
① Cut and tape green lead.
② Use original rear cover, centering deivice, width sleeve and yoke damping network if necessary.
③ Cut and form a piece of .010 gauge flash paper inside the yoke itself and support with acetate cement to provide an insulation between width sleeve and the yoke proper.
④ Connect yoke terminal #3 to horizontal output transformer terminal #2; yoke terminal #1 to horizontal output transformer terminal #4; connect 1000Ω 1 watt resistor from yoke terminals #2 and #7 to horizontal output transformer #3.
⑤ Connect thermal resistor (R98) from yoke terminal #1 to Vertical Size (Height) Control.
⑤ Connect same as original.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	Merit PART No.	Stancor #PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4000Ω	3-4Ω	95-1703	A-3935	A-3877 ①	24S49 ①	S-5X	① Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	QUAM PART No.	NOTES
SP1	6" x 9"	PM	6-8Ω	49-831 ①	6SA12E.8	① Not used in Models F3862W, WU; F3375L.
SP2	6" x 9"	PM	6-8Ω	49-831 ①	6SA12E.8	② Alternate Part #S-23529.
SP3	Electrostatic			S-24202 ② ③		③ Used in Models F3858R, W, & U, F3860M, R, & U, F3364W, Y, F3375L, F3386W, Y.
SP4	Electrostatic			S-24202 ② ③		④ Used in Model F3862W, WU.
	6" x 9"	PM	3-4Ω	49-831 ④ 49-830 ⑤	69A3	⑤ Two used in Model F3375L.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	N	7/10A 125V S/B	136-38	62-31	333.700 (N 7/10 125V S/B)	346010	N 7/10	HN 1/2 to 3/4
M2	N	5A 125V S/B	136-42	62-34	333005 (N 5A 125V S/B)	346019	N5	HN 3 1/2 to 5
M3		1 1/2" length of #24 wire						

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ZENITH PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M4		103-20 *	6GC1 *			* Dual Selenium Diode, Common Cathode Type
M5	1N295 *	103-23 *		1N295 *	1N295 *	* Crystal Diode, Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M6	Tuner	175-138	VHF
	Tuner	175-137	VHF with UHF Provisions, Used in all "U" Models
	Tuner	175-8	UHF, Used in all "U" Models
M7	Spark Gap	S-42787	
M8	Spark Gap	91-1681	
M9	Switch	S-44018	Channel Selector
M10	Switch	S-41498	Motor Switch Assembly
M11	Motor		Tuner Drive

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8484 (Flat) or 8484 (Stound) – 4 Conductor 8485 (Round) – 5 Conductor 8488 (Round) – 8 Conductor

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	GENERAL ELECTRIC * RAYTHEON * SYLVANIA * TYPE
V15	1st RF Amp.	6AU6
V16	2nd RF Amp.	6AU6
V17	Limiter-Tripler	6AU6
V18	CW-CCW Channel Sel. Disc	6AL5
V19	Vol. Step - CW Channel Sel. Relay Control Amp.	6CM7
V20	Vol. Step - Mute Disc.	6AL5
V21	CCW Channel Selector - Mute Relay Control Amp.	6CM7
V22	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C73	10	350	22-2943	PRB350	BR1045	TC52	TD-10-450	TVA-1504	
C74	5	50	22-2941	PRS1310	BR45-50	TC30	TD-5-50	TVA-1303	
C75	4	300MP	22-2893	PRS7750		TC71 †		TVANS-1603 *	

† Use two units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

REMOTE CONTROL RECEIVER
PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C76	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C77	100			BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C78	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C79	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C80	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C81	9	NPO ±1mmf		NPO-DI 10	DTZ-10	CJ0QJC	CCTO-100	CNO-410	10TCC-QJ0
C82	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C83	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C84	100	10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-310
C85	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C86A	1000	10%		DI-1000	DD-102	5R5DI	CCD-102	GP210	10TS-D10
B	1000	10%		DI-1000	DD-102	5R5DI	CCD-102	GP210	10TS-D10
C87	.047	200V		P288N-047	DD-473	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C88	.047	200V		P288N-047	DD-473	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C89	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C90	100	10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-310
C91	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C92A	1000	10%		DI-1000	DD-102	5R5DI	CCD-102	GP210	10TS-D10
B	1000	10%		DI-1000	DD-102	5R5DI	CCD-102	GP210	10TS-D10
C93	.047	200V		P288N-047	DD-473	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C94	.047	200V		P288N-047	DD-473	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C95	4700			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C96	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C97	10000			BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R101	1.5meg				R115	2.2meg			
R102	150K				R116	2.2meg			
R103	470K				R117	2.2meg			
R104	1.2meg				R118	2.2meg			
R105	68K				R119	1meg			
R106	100K				R120	1meg			
R107	1meg				R121	1meg			
R108	47K				R122	100Ω 10W	PW10-100Ω	10W SQ 100Ω	#63-3667
R109	100Ω				R123	330K			
R110	2.2meg				R124	47K			
R111	2.2meg				R125	10K			
R112	2.2meg				R126	3300Ω			
R113	2.2meg				R127	22K			
R114	1meg								

Zenith Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L17	39.5KC Trans.	S-43725					
L18	122.25KC Discr. (Primary)	S-24788					
L19	122.25KC Discr. (Secondary)	S-24789					
L20	114.75KC Discr. (Primary)	S-24788					
L21	114.75KC Discr. (Secondary)	S-24789					

TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	117V @ .38A	220V @ .020A DC Tap @ 35V @ .001A DC Tap @ 6.3V @ 2.9A	95-1612					
	SEC. 2							
	5V @ 2A							

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	ZENITH PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M12	.001	212-21 *		Model 12 *		* Selenium Type

REMOTE CONTROL RECEIVER
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M13	3AG	3/4A 250V S/B	136-41		313.750 (3AG 3/4A 250V S/B)	357001	MDL 3/4	4405

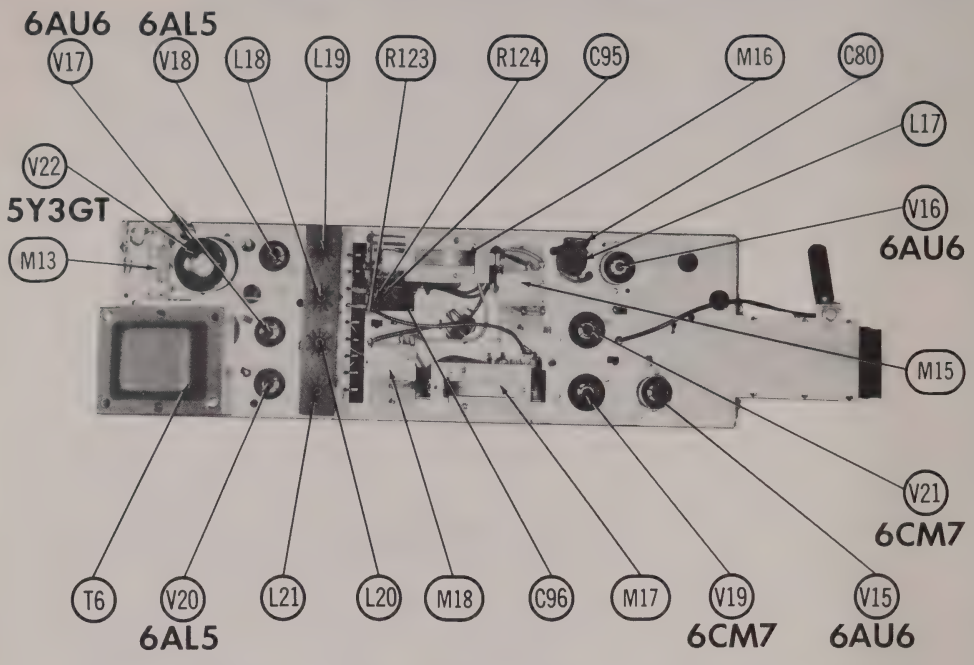
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M14	Switch	85-580	Auto-Manual (SPDT Slide Type)
M15	Relay	195-5 or 195-7	C. C. W.
M16	Relay	S-43723	Step (Includes Stepper Switch #S-43854 & S-43926)
M17	Relay	195-5 or 195-7	C. W.
M18	Relay	S-24705	Sound, Bi-Stable
M19	Microphone	S-50333	

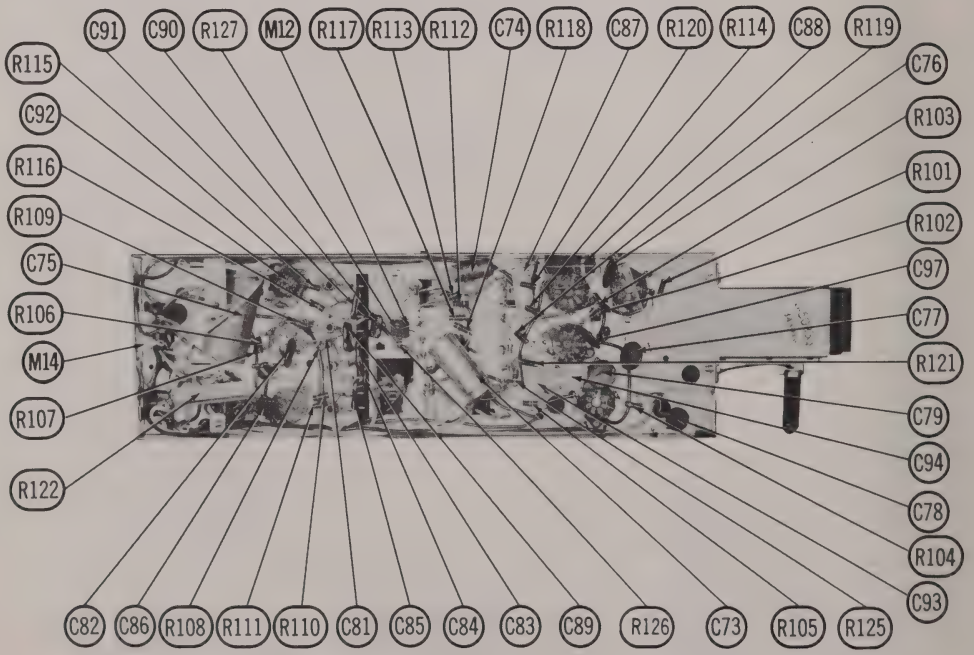
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL NO.	F2858R	F2858RU	F2858W	F2858WU	F2860M	F2860MU	F2860R	F2860RU	F2862W	F2862WU	F3360W	F3360Y	F3364W	F3364Y	F3368M	F3368R	F3370W	F3375L	F3380W	F3380Y	F3385H
Knob, VHF Channel Selector	46-2510		X	X	X	X	X	X	X	X													
Knob, "	46-2341										X	X											
Knob, "	S-47420												X	X	X	X	X	X	X	X	X	X	X
Knob, UHF Channel Selector	S-48229			X		X		X		X													
Knob, "	S-46873											X											
Knob, UHF Channel Indicator	S-48228			X		X		X		X													
Knob, "	S-45733											X											
Knob, Fine Tuning	S-49930		X	X	X	X	X	X	X	X													
Knob, "	S-49420										X	X											
Knob, "	46-2035												X	X	X	X	X	X	X	X	X	X	X
Knob, Volume	S-45716		X	X	X	X	X	X	X	X	X						X	X	X	X	X	X	X
Knob, "	S-46726											X	X	X	X	X							
Knob, Brightness, Vert. Hold	S-50934		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob, Contrast	S-50935		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob, Horizontal Hold	46-2509		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob, Tone	S-45716		X	X	X	X	X	X	X	X							X	X	X	X	X	X	X
Knob "	S-46726										X	X	X	X	X	X							
Cabinet	14-3344		X	X																			
Cabinet	14-3343				X	X																	
Cabinet	14-3342						X	X															
Cabinet	14-3341								X	X													
Cabinet	14-3246										X	X											
Cabinet	14-3243												X										
Cabinet	14-3244													X									
Cabinet	14-3262														X								
Cabinet	14-3263															X							
Cabinet	14-3352																X						
Cabinet	14-3351																	X					
Cabinet	14-3261																		X				
Cabinet	14-3260																			X			
Cabinet	14-3357																				X		
Cabinet	14-3358																					X	
Cabinet	14-3258																						X



REMOTE CONTROL RECEIVER S-50264 - TOP VIEW



REMOTE CONTROL RECEIVER S-50264 - BOTTOM VIEW

VHF TUNER ALIGNMENT INSTRUCTIONS

175–137, 175–138

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

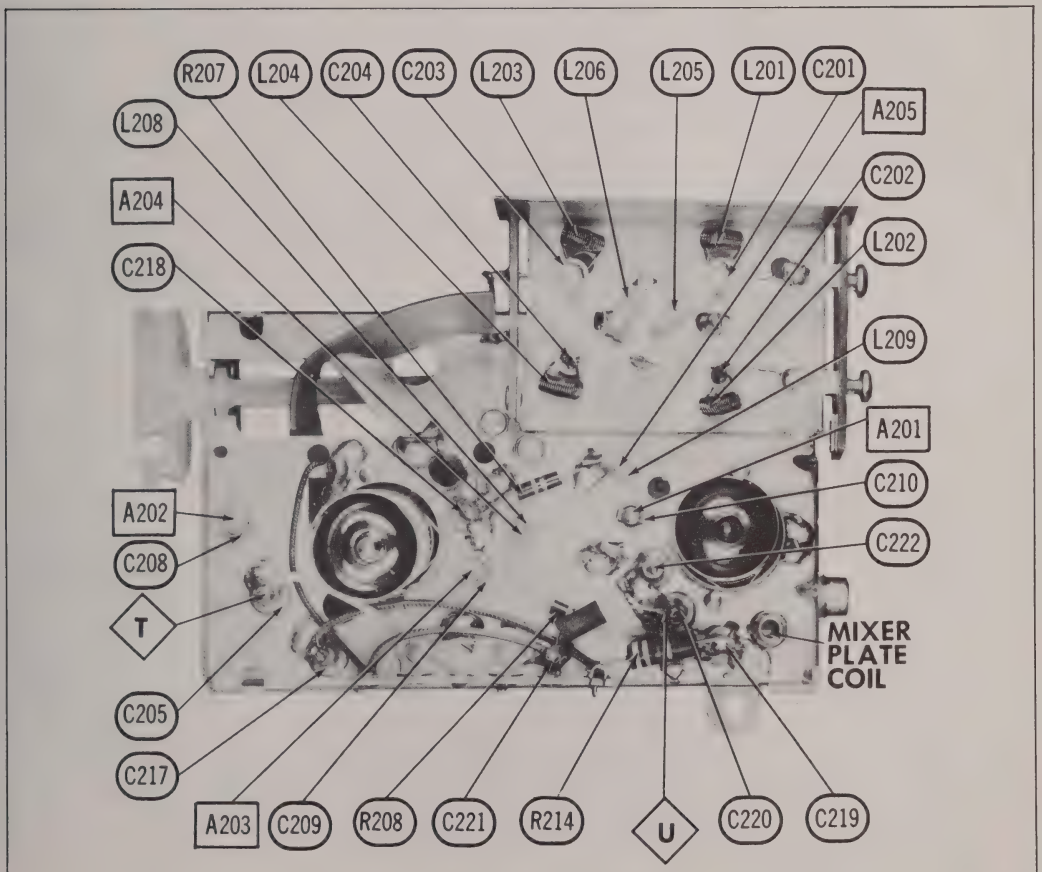
VHF OSCILLATOR ALIGNMENT

Individual channel adjustment screws are accessible one at a time, thru a hole in the back of the tuner, as the channel selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

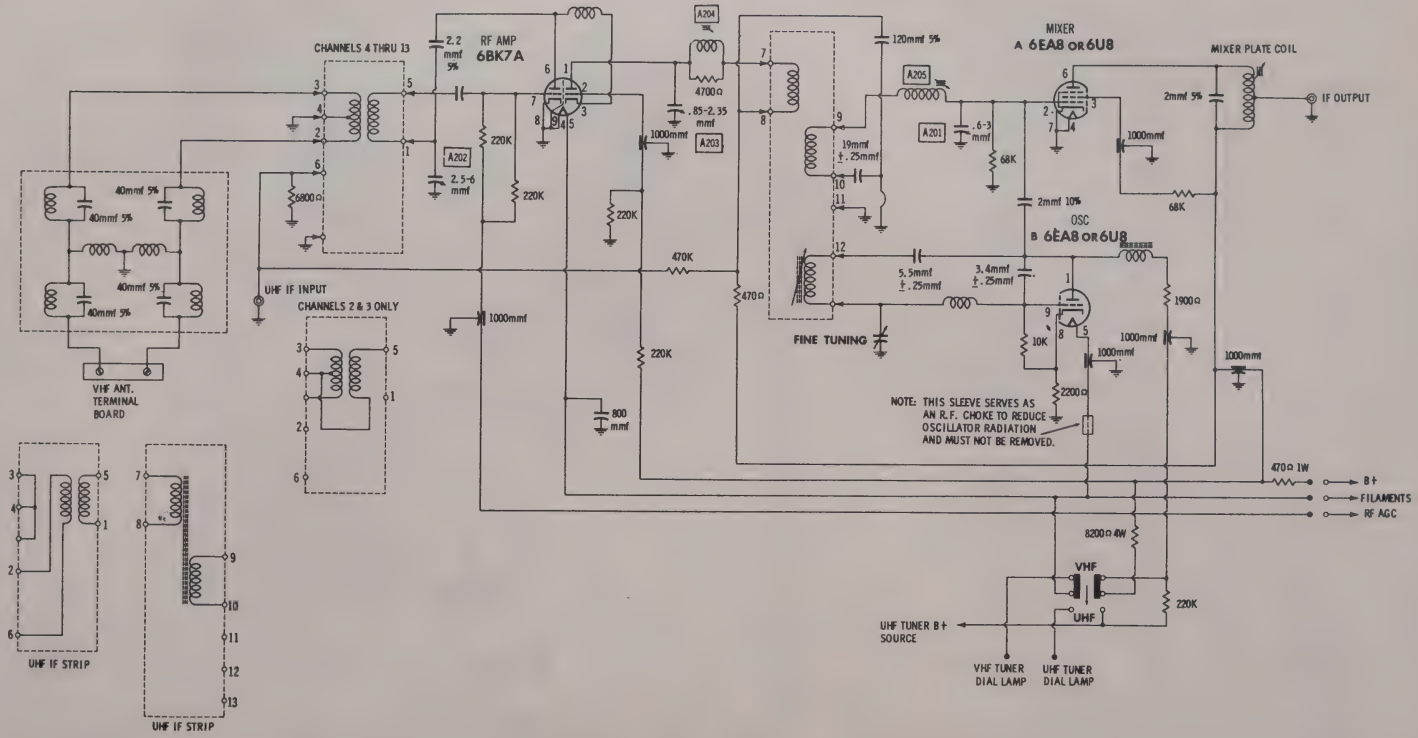
VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	50-300Ω	Across VHF antenna terminals thru matching transformer.	69MC (10MC Swp.)	67.25MC 71.75MC	4	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202, A203	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2.	"	"	201MC (10MC Swp.)	199.25MC 203.75MC	"	"	A204, A205	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. Repeat steps 1 and 2 until best overall symmetry is obtained.



VHF TUNER 175–138 —TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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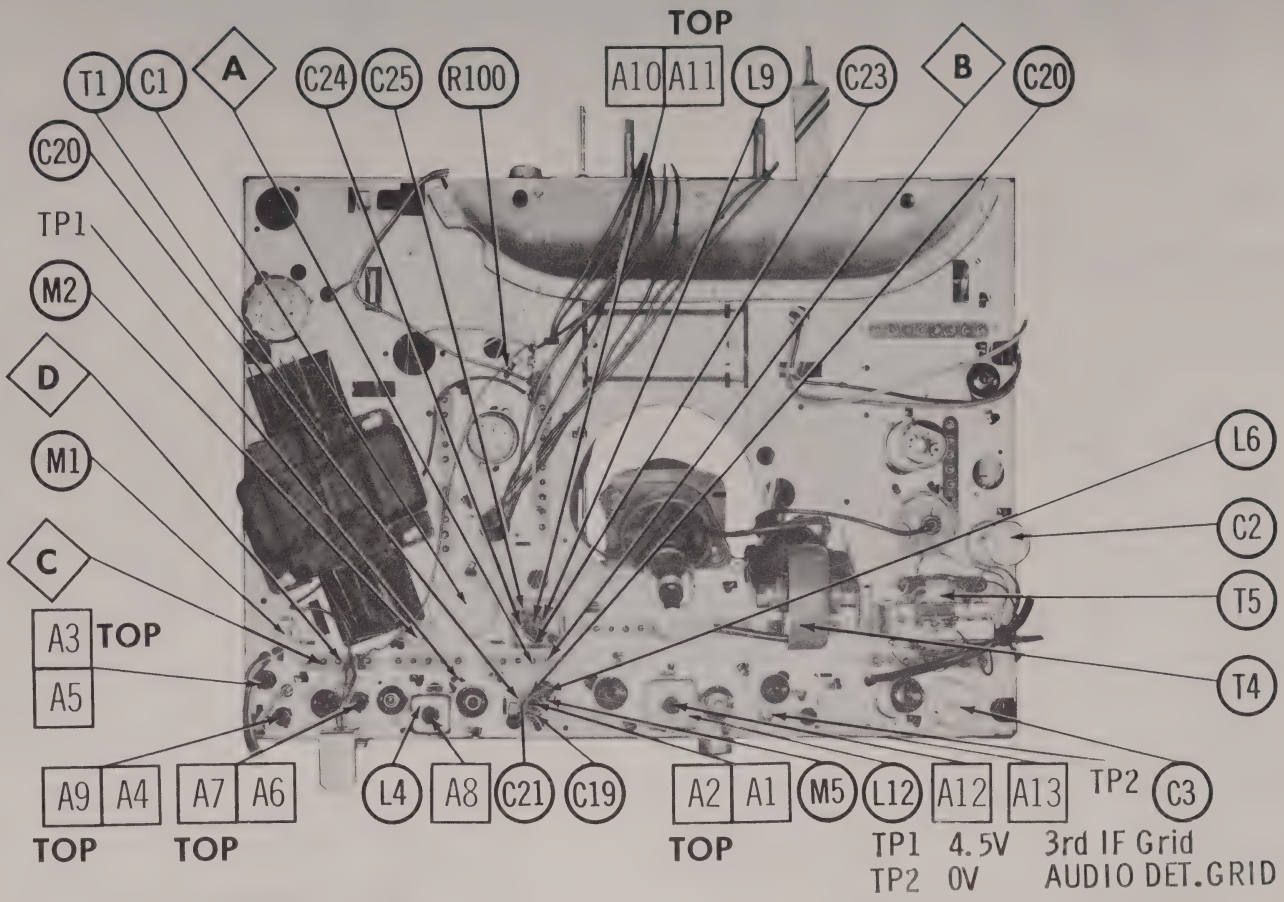
VHF TUNER with UHF Provisions 175-137

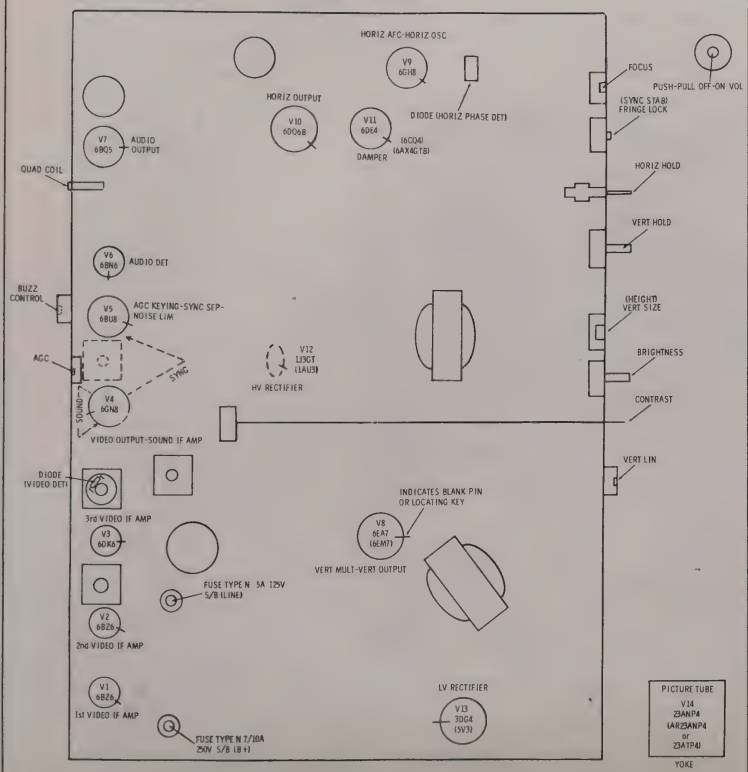


TV CHASSIS - TOP VIEW

ZENITH CHASSIS 16F28, 16F28G, 16F28U

TUBE PLACEMENT CHART

BOTTOM VIEW

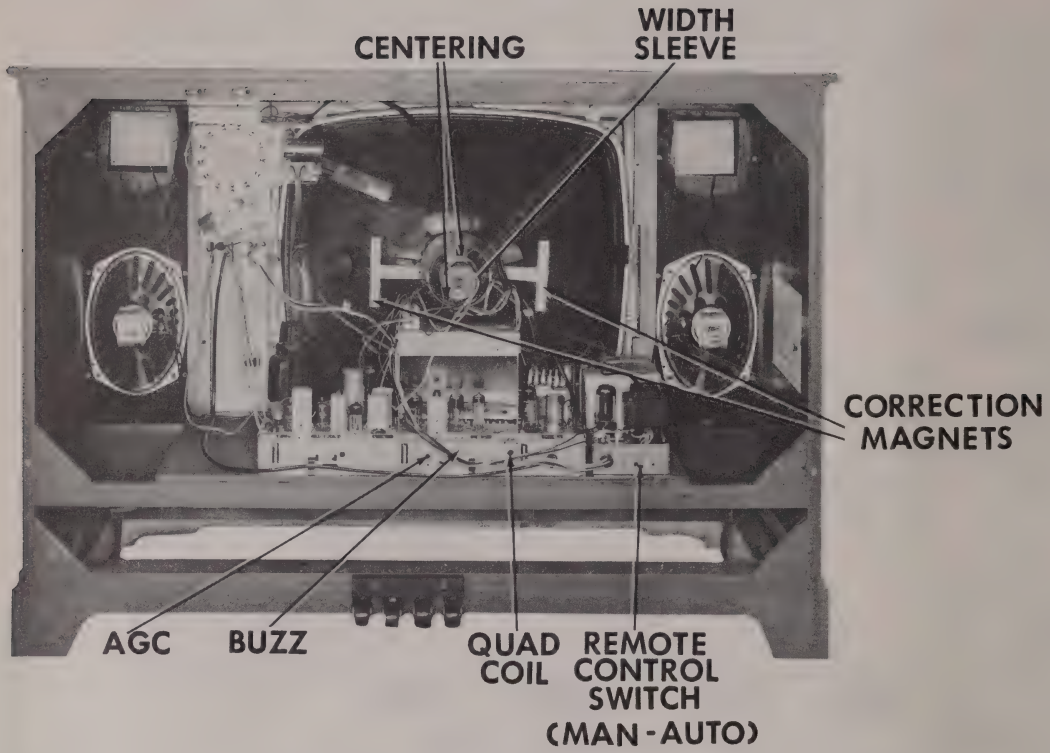


RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1.4meg	1550Ω	.1Ω	0Ω	▪220Ω	▪220Ω	1500Ω		
V2	6BZ6	30K	INF	.1Ω	0Ω	†270Ω	†270Ω	▪22Ω		
V3	6DK6	18K	470Ω	.1Ω	0Ω	†8250Ω	†8250Ω	0Ω		
V4	6GN8	0Ω	100K	† 470K	.1Ω	0Ω	15Ω	3000Ω	†27K	†7000Ω
V5	6BU8	• 7000Ω	†22K	680K	.1Ω	0Ω	110K	•†350K	†70K	†8.2meg
V6	6BN6	• 350Ω	.2Ω	.1Ω	0Ω	†27K	3.7Ω	†390K		
V7	6BQ5	NC	10K	220Ω	.1Ω	0Ω	NC	†1150Ω	NC	†520Ω
V8	6EA7	2.2meg	†400Ω	• 1400Ω	• 600K	• † 4meg	0Ω	0Ω	.1Ω	
V9	6GH8	†100K	100K	†47K	0Ω	.1Ω	† 120K	98Ω	0Ω	1.5meg
V10	6DQ6B	TP	.1Ω	NC	†8300Ω	1meg	NC	0Ω	0Ω	TOP CAP †9Ω
V11	6DE4	NC	NC	1.1meg	NC	†50Ω	NC	0Ω	.1Ω	
V12	1J3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †295Ω
V13	3DG4	¶25K	TP	¶25K	TP	19Ω	TP	20Ω	TP	
V14	Z3ANP4	.1Ω	18K	Pin 6 • †1.4meg	Pin 10 † 50K	Pin 11 • 200K	Pin 12 0Ω			
V201	6BK7A	†1000Ω	140K	INF	0Ω	.1Ω	INF	3meg	0Ω	0Ω
V202	6EA8	†10K	68K	†68K	.1Ω	0Ω	†500Ω	0Ω	2200Ω	12K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT."
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 3 OF V13.
† MEASURED FROM PIN 3 OF V11.
▪ MEASURED FROM PIN 2 OF V2.

NC NO CONNECTION
TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The Horizontal Hold is equipped with a stop which limits rotation to approximately 270° with the knob on the shaft. To adjust, remove the knob and adjust by turning the shaft until the picture is synchronized to the point where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. Install the knob with its pointer centered between the stops.

DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL MODEL F3368M

1. Remove 8 wood screws holding rear cover.
2. Remove rear cover.
3. Remove 3 knobs at front of cabinet.
4. Remove 2 screws (inside cabinet) holding control panel.
5. Disconnect plugs and leads to VHF Tuner and Remote Control Receiver.
6. Disconnect speaker leads.
7. Remove 4 chassis bolts.
8. Remove 4 screws (inside cabinet) holding picture tube mounting to cabinet.
9. Remove chassis (with picture tube).

PICTURE TUBE REMOVAL

The picture tube is mounted on the chassis. It is necessary to remove the chassis for picture tube removal. (See "TV Chassis Removal").

PHOTOFACT® Folder

**PRODUCTION CHANGE
BULLETIN 256**

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 13 IN SET 446

MAGNAVOX CHASSIS 57-01-21, 57-01-32

Magnavox Chassis 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11 were covered in PHOTOFACT Folder 13 - Set 446.

Chassis 57-01-21, 57-01-32 are electrically similar except for the following changes.

Ch. 57-01-21

COMPONENT CHANGES

V3 is changed from a Type 6BZ6 to a Type 6BA6.

R13 is decreased from 2700Ω to 820Ω.

R24 is omitted.

R28 is decreased from 330K to 150K.

A 5mmf Capacitor is added between lugs 1 and 3 of L13.

Ch. 57-01-32

COMPONENT CHANGES

V3 is changed from a Type 6BZ6 to a Type 6BA6.

R13 is decreased from 2700Ω to 820Ω.

R24 is omitted.

R28 is decreased from 330K to 150K.

The 5mmf Capacitor between lugs 1 and 3 of L13 is omitted.

This chassis uses a different AC power supply. For additional information on the power supply, see PHOTOFACT Folder 7 - Set 505.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 18 IN SET 502

WESTINGHOUSE MODELS H-775L6, H-776L6 (CH. V-2401-4)

Westinghouse Models H-722T6, H-723T6 (Ch. V-2401-2) were covered in PHOTOFACT Folder 18 - Set 502.

Models H-775L6, H-776L6 (Ch. V-2401-4) are electrically similar except for the following changes.

COMPONENT CHANGES

C3 is decreased from 68mmf to 47mmf.

C6 is omitted.

L1 (Loopstick Antenna) is changed to Part #310V066H01.

L2 (RF Coil) is changed to Part #230V086H02.

L3 (Osc. Coil) is changed to Part #230V004H03.

L4 (Input IF Trans.) is changed to Part #235V053H11.

L5 (Input IF Trans.) is changed to Part #235V053H12.

M1 (Tuning Capacitor) is changed to Part #330V032H02.

COMPONENTS ADDED

A .025mfd Capacitor (Part #215V300A68) is added across the interlock.

A Pilot Light Assembly (Part #759V135H01) is added across the interlock.

(Continued On The Reverse Side)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PRODUCTION CHANGE
BULLETIN 256

PRODUCTION CHANGE
BULLETIN 256

SET 524 FOLDER 3

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	550V141H01	Tuning, Volume
Knob	550V138H02	Pushbutton (Clock), Model H-775L6
Knob	550V138H03	Pushbutton (Clock), Model H-776L6
Cabinet Front	558V276H04	Model H-775L6
Cabinet Front	558V276H05	Model H-776L6
Cabinet	513V057H04	Model H-775L6
Cabinet	513V057H05	Model H-776L6
Dial	550V139H02	Tuning
Crystal	558V277H01	Clock
Hand	558V242H02	Hour
Hand	558V289H03	Minute
Hand	558V290H02	Second
Hand	558V182H02	Alarm Set

Fisher Model TA-600 (Chassis Serial Numbers 20001-29999 Inclusive) were covered in PHOTOFACT Folder 10 - Set 478.

Model TA-600 (Chassis Serial Numbers 50001-59999 Inclusive) are electrically similar except for the following changes.

COMPONENT CHANGES

A Resistor-Capacitor Couplate (Part #PC50187-3) is used in place of C81, C82, C83, R73, R74, R75.

A Resistor-Capacitor Couplate (Part #PC50187-3) is used in place of C112, C113, C114, R115, R116, R117.

A Resistor-Capacitor Couplate (Part #PC50187-2) is used in place of C96, C97, C98, R86, R87.

A Resistor-Capacitor Couplate (Part #PC50187-2) is used in place of C127, C128, C129, R130, R131.

A Resistor-Capacitor Couplate (Part #PC50187-4) is used in place of C89, C90, C92, C93, R82, R83.

A Resistor-Capacitor Couplate (Part #PC50187-4) is used in place of C120, C121, C123, C124, R125, R126.

R71 is decreased from 10meg to 4.7meg.

R113 is decreased from 10meg to 4.7meg.

R78 is increased from 15meg to 22meg.

R76 is decreased from 2.2meg to 1.8meg.

R121 is increased from 15meg to 22meg.

R120 is decreased from 2.2meg to 1.8meg

R2A, B is changed to Part #R50160-49.

R75 is decreased from 2.2meg to 2meg.

R117 is decreased from 2.2meg to 2meg.

R93 is omitted.

R138 is omitted.

R38 is increased from 390K to 10meg.

R37 is decreased from 10meg to 180K.

A 6800Ω Resistor is added in series to ground with R34.

R34 is decreased from 15K to 6800Ω.

C79 & L23 are reversed; with this change C79 is connected across R9 (Input Level AM).

L23 is relocated between the high side of R9 and C80, a 900mmf Capacitor is added in parallel with L23.

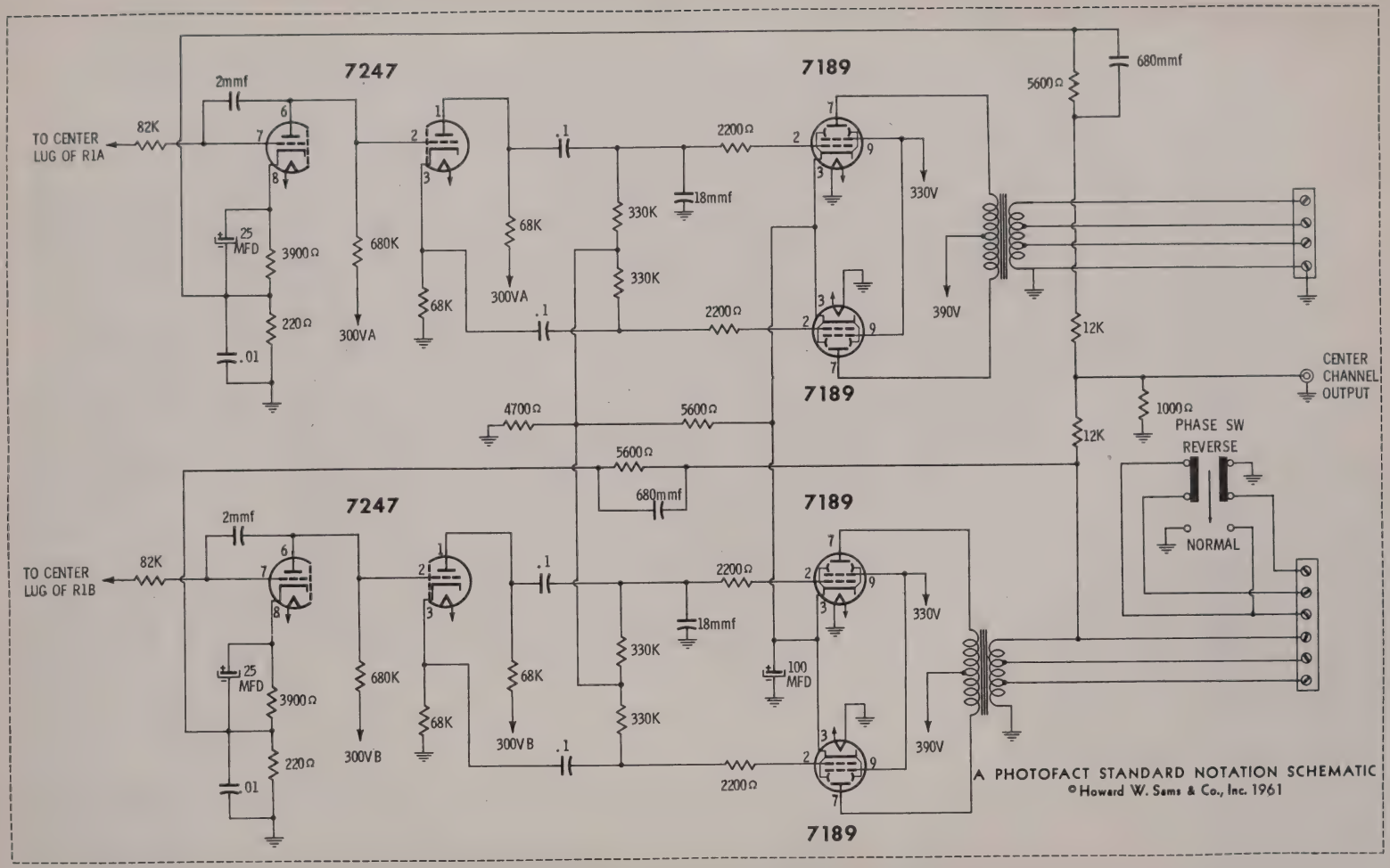
TUBE CHANGE

V13 (AF Amp/Phase Inverter) is changed to a Type 7247.

V18 (AF Amp/Phase Inverter) is changed to a Type 7247.

With these tube changes, the circuit and component values change. A partial schematic diagram showing the different circuit and component changes is given in this bulletin.

(Continued On The Reverse Side)


7247
7189
2mmf
82K
TO CENTER LUG OF R1A
25 MFD
3900Ω
220Ω
.01
680K
300VA
68K
.1
330K
18mmf
2200Ω
330V
390V
5600Ω
680mmf
12K
CENTER CHANNEL OUTPUT
1000Ω
PHASE SW
REVERSE
NORMAL
4700Ω
5600Ω
680mmf
TO CENTER LUG OF R1B
100 MFD
300VB
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PHOTOFACT® Folder

AIRLINE MODELS WG-2805A, WG-2806A, WG-2807A

AIRLINE MODELS WG-2805A, WG-2806A, WG-2807A

MODEL WG-2805A

AIRLINE MODELS WG-2805A, WG-2806A, WG-2807A

TRADE NAME	Airline Models WG-2805A, WG-2806A, WG-2807A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago 7, Illinois
TYPE SET	AC Operated 12 Tube FM-AM Receiver With Stereo Amplifier and 4 Speed Automatic Record Changer
POWER SUPPLY	105 — 125 Volts AC, 60 Cycles RATING 91 Watts, .85 Amp. @117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	535 — 1620KC FREQ. MOD. 88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

SET 524 FOLDER 4

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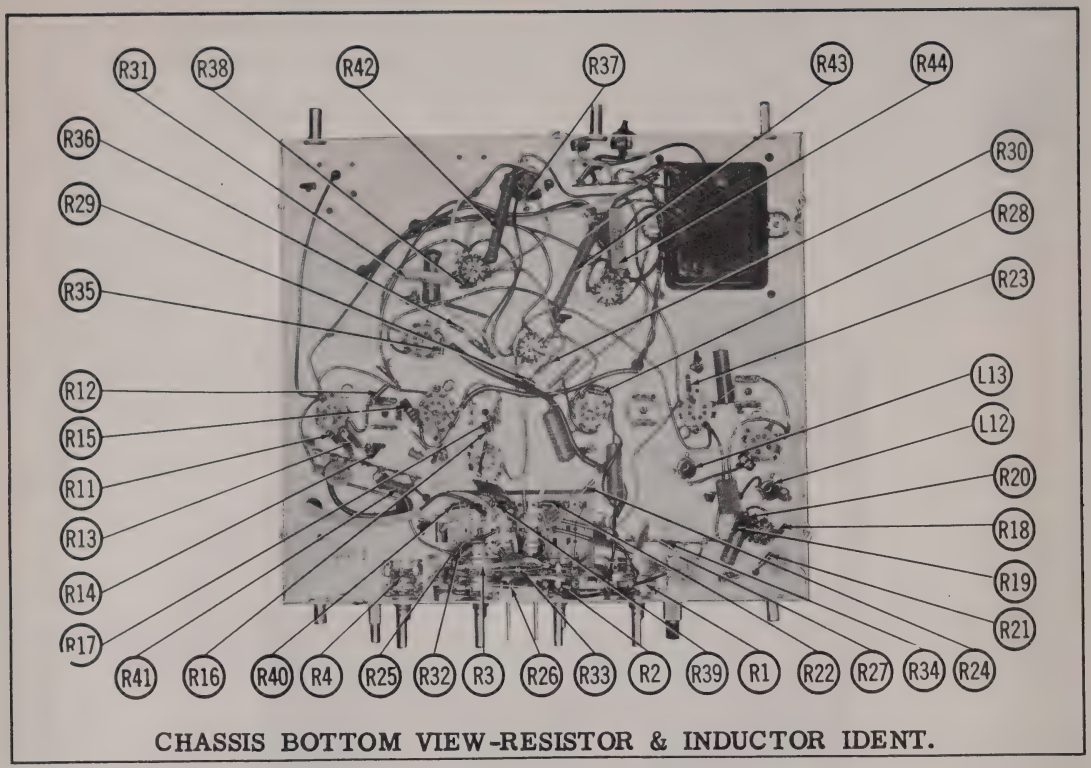
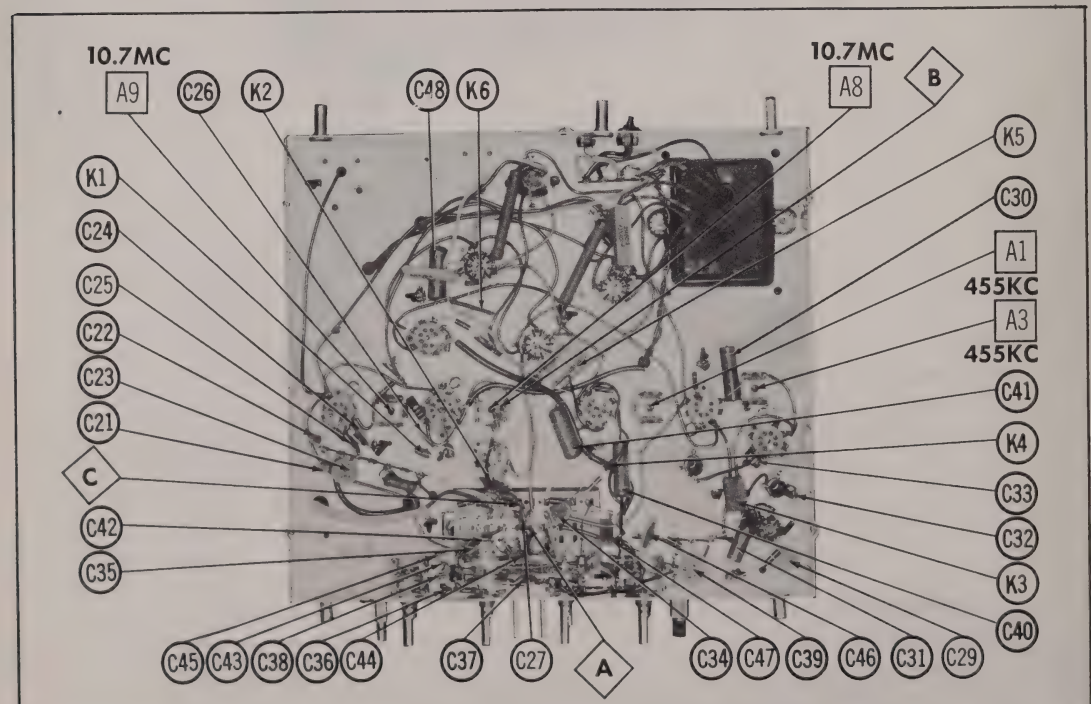
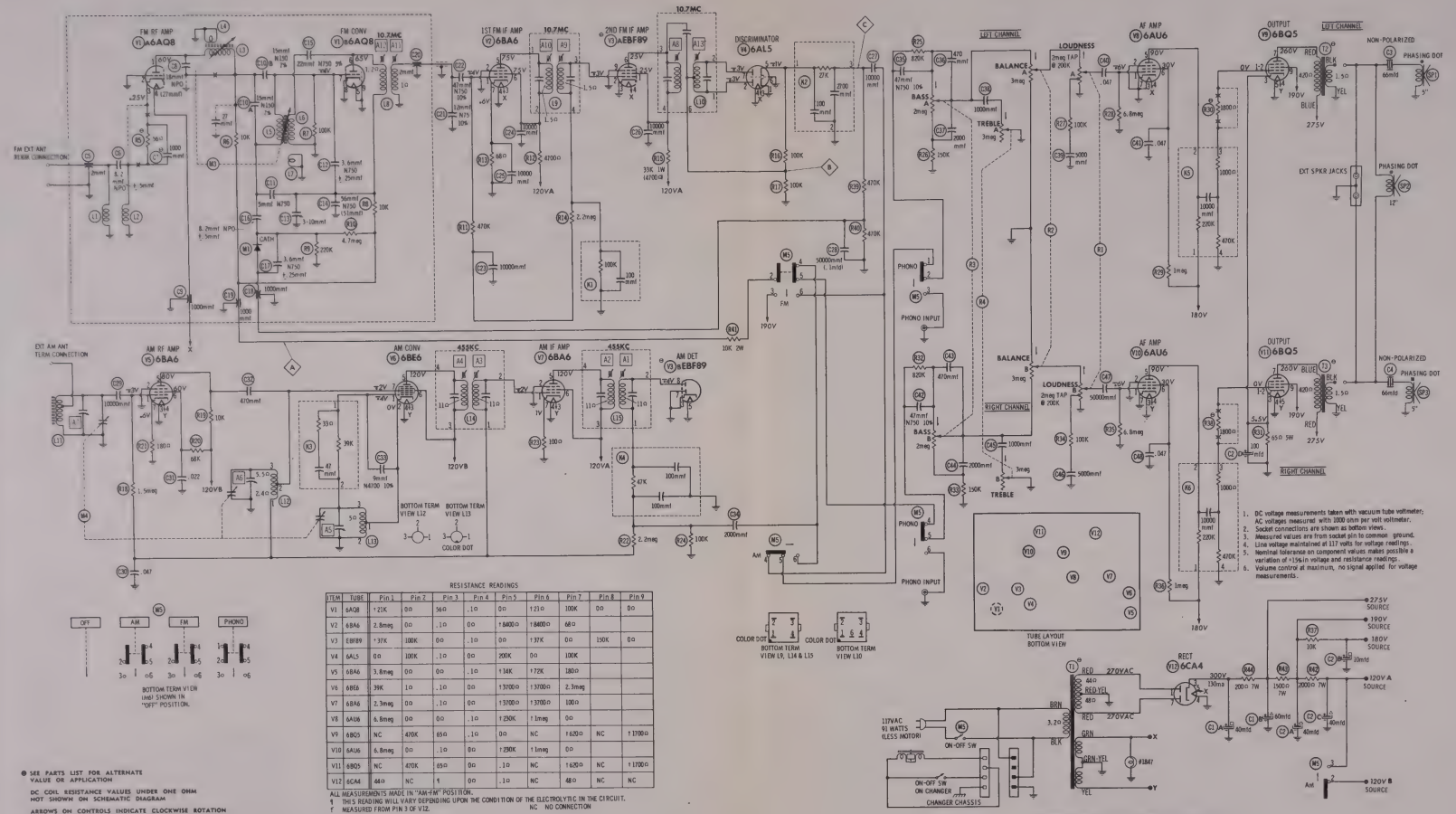
KN379



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8	†21K	0Ω	56Ω	.1Ω	0Ω	†21Ω	100K	0Ω	0Ω
V2	6BA6	2.8meg	0Ω	.1Ω	0Ω	†8400Ω	†8400Ω	68Ω		
V3	EBF89	†37K	100K	0Ω	.1Ω	0Ω	†37K	0Ω	150K	0Ω
V4	6AL5	0Ω	100K	.1Ω	0Ω	200K	0Ω	100K		
V5	6BA6	3.8meg	0Ω	0Ω	.1Ω	†14K	†72K	180Ω		
V6	6BE6	39K	1Ω	.1Ω	0Ω	†3700Ω	†3700Ω	2.3meg		
V7	6BA6	2.3meg	0Ω	.1Ω	0Ω	†3700Ω	†3700Ω	100Ω		
V8	6AU6	6.8meg	0Ω	0Ω	.1Ω	†250K	†1meg	0Ω		
V9	6BQ5	NC	470K	65Ω	.1Ω	0Ω	NC	†620Ω	NC	†1700Ω
V10	6AU6	6.8meg	0Ω	.1Ω	0Ω	†250K	†1meg	0Ω		
V11	6BQ5	NC	470K	65Ω	0Ω	.1Ω	NC	†620Ω	NC	†1700Ω
V12	6CA4	44Ω	NC	¶	0Ω	.1Ω	NC	48Ω	NC	NC

ALL MEASUREMENTS MADE IN "AM-FM" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V12. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AIRLINE MODELS WG-2805A, WG-2806A, WG-2807A

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
- A1 Thru A4..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989; WALSCO #2515, 2531, 2532
- A5, A6, A7..... GENERAL CEMENT #5004, 5008, 5009; WALSCO #2520
- A8, A9, A10, A13.. GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440; WALSCO #2526, 2543, 2544, 2545
- A11, A12.....GENERAL CEMENT #9296, 9297; WALSCO #2546, 2547

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru 470Ω to AM external antenna. Low side to chassis.	1620KC	"	"	A5	Adjust for maximum output.
3.	"	1400KC	1400KC Signal.	"	A6, A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to point (A). Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe thru 1meg to point (B)	A8, A9, A10, A11, A12	Adjust for maximum deflection.
5.	"	"	"	DC probe to point (C). Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to point (A). Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. thru 47K to point (B). Low side to chassis.	A8, A9, A10, A11, A12	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A13	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of cross-over lines.

FIG. 1

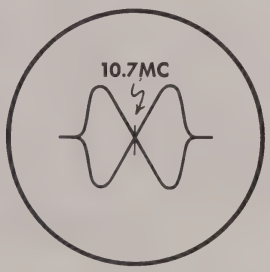
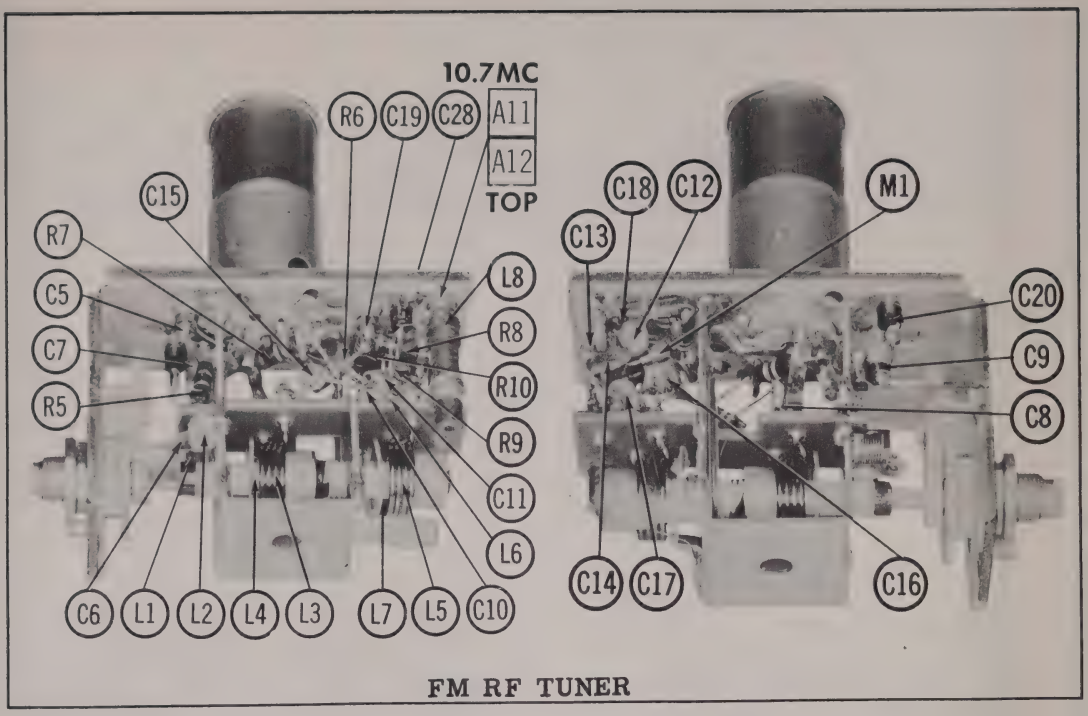
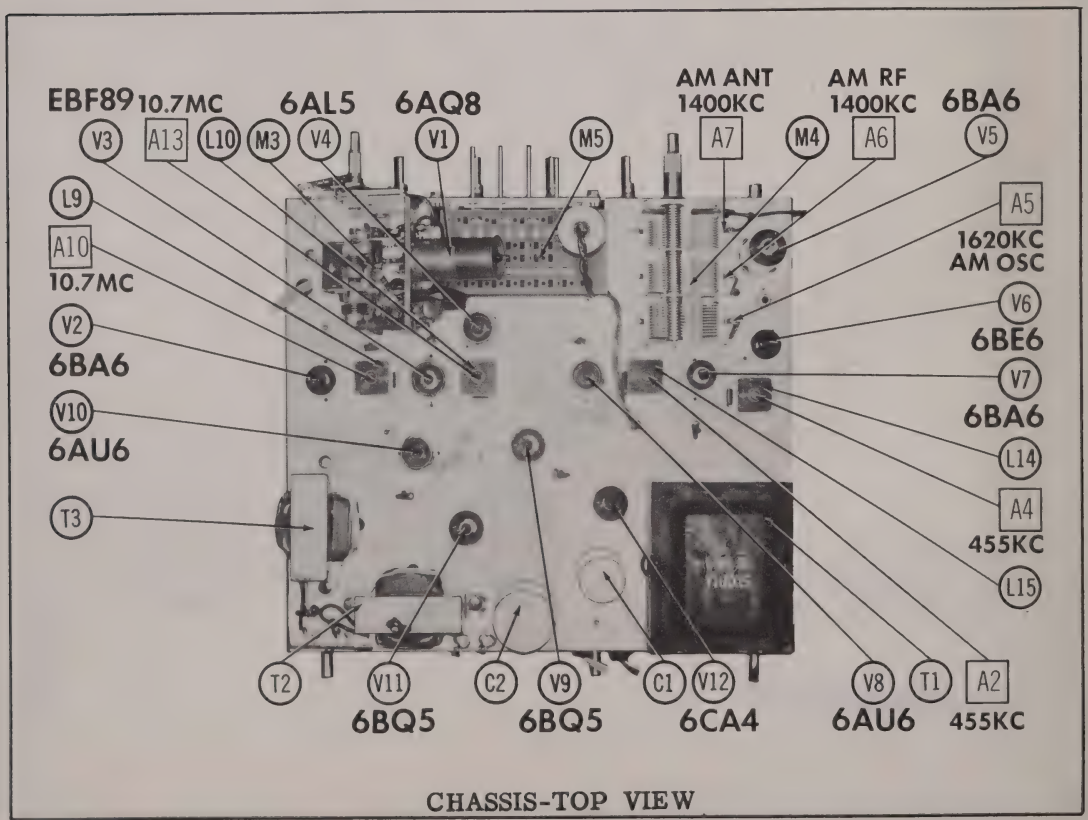


FIG. 2



FM RF TUNER



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	6AQ8	V7	AM IF Amplifier	6BA6
V2	1st FM IF Amplifier	6BA6	V8	Left Channel AF Amp.	6AU6
V3	2nd FM IF Amp. -AM Det.	EBF89 (6DC8) *	V9	Left Channel Output	6BQ5
V4	Discriminator	6AL5	V10	Right Channel AF Amp.	6AU6
V5	AM RF Amplifier	6BA6	V11	Right Channel Output	6BQ5
V6	AM Converter	6BE6	V12	Rectifier	6CA4

GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	350	45X474		A0380	FP137.2	TMS-1640	TVL-1624	
B	▲60	350			BR6035	TC78	TD-40-350	TVA-1611	
C2A	▲40	350	45X475	AFH4-87	D0660	FP431.7	TMQ-4592	TVLS-4621.8*	
B	■10	350							
C	▲40	350							
D	100	15							
C3	66	10NP	45X473	PRS7220	BR6015	ST75		TVANS-1117 *	
C4	66	10NP	45X473	PRS7220	BR6015	ST75		TVANS-1117 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	2	#31B-176-07						
C6	8.2 NPO ± .5mmf	#13L8CH8R2D	NPO-DI 8.2		C10V82C			10TCC-V82
C7	1000	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	18 NPO	(27) †		TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C9	1000		EF-001	MFT-1000		CCF-102	CT280A	
C10A	15 N150 7%	#13L-033				*		10TCP-Q15
B	15 N150 7%					*		10TCP-Q15
C11	5 N750			DTN-5	C10V5U	CCTN-050	CN7-555	10TCU-V50
C12	3.6 N750 ± .25mmf	#13L8UJ3R6C	N750-DI 3.3	DTN-3R3	C10V33U	CCTN-3R3	CN7-533	10TCU-V33
C13	3-10	#19B-902-9		829-10				
C14	56 N750	(51) †		TCN-56	C10Q56U	CCTN-560	CN7-456	10TCU-Q56
C15	22 N750 5%		NPO-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C16	8.2 NPO ± .5mmf	#13L8CH8R2D				*		
C17	3.6 N750 ± .25mmf	#13L8UJ3R6C					CN7-533	10TCU-V33
C18	1000		EF-001	MFT-1000		CCF-102	CT280A	
C19	1000		EF-001	MFT-1000		CCF-102	CT280A	
C20	2	#31B-176-07						
C21	12 N75 10%	#80X74				*		
C22	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	50000	(.1mfd) †	BPD-05	DD-503	CUB4S5	4DP-3-503	GP150	5HK-S50
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C31	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C32	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C33	9 N4700 10%	#47X632				*		
C34	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C35	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C36	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C37	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C38	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C39	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C40	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C41	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C42	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C43	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C44	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C45	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C46	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C47	50000		BPD-05	DD-503	CUB4S5	4DP-3-503	GP150	5HK-S50
C48	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

Airline Part Number.
Note 1. Not used in some versions.
† Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	36X428	BT-174 *				Loudness, Left Channel
	200K Tap							
B	2meg	½		STR-174 *				Loudness, Right Channel
	200K Tap							
R2A	3meg	½	36X429				FA36A	Balance, Left Channel
B	3meg	½					RU36R	Balance, Right Channel
C	Shaft						CS3500	
R3A	2meg	½	40X486	B-76	AD47-2meg-B		FA26A	Bass, Left Channel
B	2meg	½		SR-76	Not Req.		RU26A	Bass, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
R4A	3meg	½	40X485	B-85			FA36A	Treble, Left Channel
B	3meg	½		SR-85			RU36A	Treble, Right Channel
C	Shaft			Not Req.			CS3500	

* Omit tap 2.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	56Ω			Note 1
R6	10K			
R7	100K			
R8	10K			
R9	220K			
R10	4.7meg			
R11	470K			
R12	4700Ω			
R13	68Ω			
R14	2.2meg			
R15	33K 1W			(4700Ω) *
R16	100K			
R17	100K			
R18	1.5meg			
R19	10K			
R20	68K			
R21	180Ω			
R22	2.2meg			
R23	100Ω			
R24	100K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R25	820K			
R26	150K			
R27	100K			
R28	6.8meg			
R29	1meg			
R30	1800Ω			Note 1
R31	65Ω 5W	PW5-65Ω	5W-SQ-65	
R32	820K			
R33	150K			
R34	100K			
R35	6.8meg			
R36	1meg			
R37	10K			
R38	1800Ω			Note 1
R39	470K			
R40	470K			
R41	10K 2W			
R42	2000Ω 7W	PW10-2000Ω	10W-SQ-2000	
R43	1500Ω 7W	PW10-1500Ω	10W-SQ-1500	
R44	200Ω 7W	PW10-200Ω	10W-SQ-200	

Note 1. Not used in some versions.
* Alternate Value.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K1	FM IF Grid Bias	100mmf, 100K	76X28	
K2	Discr. Network	100mmf, 2700mmf, 27K	76X32	
K3	AM Osc. Grid	47mmf, 33Ω, 39K	76X20	
K4	AM Diode RF Filter	100mmf, 100mmf, 47K	76X30	Aerovox PA-97 Centralab PC-50 Cornell-Dubilier 1ilTM1 Sprague D-1
K5	Audio Coupling	10000mmf, 1000Ω, 220K, 470K	76X31	
K6	Audio Coupling	10000mmf, 1000Ω, 220K, 470K	76X31	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	FM Ant.	34A-1002				
L2	Cathode Choke	34A-1002-01				
L3	FM RF	31T-3543				
L4	Inductance Trimmer	31K-338-01				
L5	FM Osc.	31T-3682				
L6	Feedback	28R1-34BONR-92				
L7	Inductance Trimmer	31K-338-01				
L8	1st FM IF	31U-619				
L9	2nd FM IF	9A2440	FM-254	1463	RTC-8599	
L10	Discriminator	9A2450	FM-253	1464	RTC-8665	
L11	Loopstick	9A2474	BC-419	705-A		
L12	AM RF	9A2473				
L13	AM Osc.	9A2472	BC-400	70-OSC	RTC-9192	
L14	1st AM IF	9A2469	BC-352	12-C1	RTC-8632	
L15	2nd AM IF	9A2470	BC-353	12-C2	RTC-8633	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V@ .85A	540VCT @.130A DC	12.6VCT @2.7A	53X391A①					① Alternate Part # 53X391

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6500Ω	6-8Ω	51X220 ①	A-2901②	A-2313	22S88	S-56Z	① Alternate Part #51X220-1.
T3	6500Ω	6-8Ω	51X220 ①	A-2901 ②	A-2313	22S88	S-56Z	② Drill new mounting hole (s).

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA AIRLINE PART No.	QUAM PART No.	NOTES
SP1	5"	PM	6-8Ω	12A582	5A1RZ8	
SP2	12"	PM	14-16Ω	12A581	12A31Z16	
SP3	5"	PM	6-8Ω	12A582	5A1RZ8	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA AIRLINE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M1		24A-009				FM AFC

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	AIRLINE PART No. CARTRIDGE	AIRLINE PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2	60-84①	J-47X*(LP and J-43*(STD)	13TB	Not Req.	26S	S1-1* & S3-3 *	8TA4-S	N-8TA-S *	① Includes needles.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuner	25A1200	FM, Complete
M4	Tuning Cap.	14A242	AM, 3 Gang (Ant. 29—395mmf, RF 29—388mmf, Osc. 24—170mmf)
M5	Switch	2A525	Selector, Pushbutton Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	10A1008	Tuning FM
Knob	10A1007-2	Tuning AM
Knob	10A1010	Indicator, FM
Knob	10A1011	Indicator, AM
Knob	10A1007-1	Loudness, Bass, Treble, Balance
Knob	10A1009	Pushbutton
Leg	79X204-4	Cabinet, Oak
Leg	79X205-2	Cabinet, Walnut, Front
Leg	79X204-3	Cabinet, Walnut, Rear

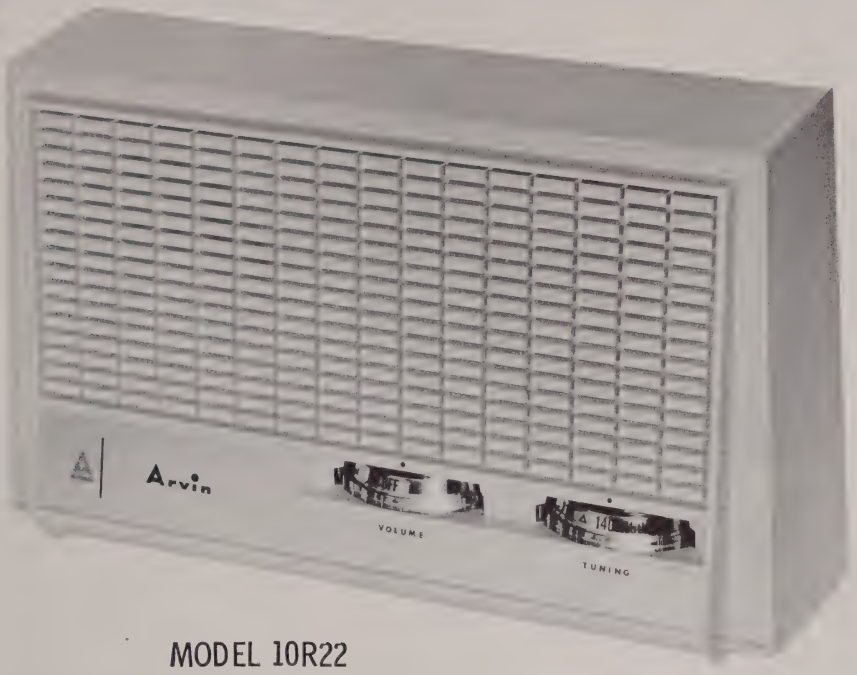
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

ARVIN MODELS 10R22, 10R27 (Ch. 1.49700, 1.49701)

ARVIN MODELS 10R22,
10R27 (Ch. 1.49700, 1.49701)



MODEL 10R22

ARVIN MODELS 10R22,
10R27 (Ch. 1.49700, 1.49701)

TRADE NAME	Arvin Models 10R22, 10R27 (Ch. 1.49700, 1.49701)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	AC-DC Operated, 5 Tube AM Receiver
POWER SUPPLY	105 – 125 Volts AC-DC
TUNING RANGE—BROADCAST	540 – 1670KC RATING 21 Watts, .22 Amp. @117 Volts AC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator.
Suggested Alignment Tools: A1 thru A4, A6... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A7.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	"	"	A6	"
4.	"	1400KC	1400KC Signal.	"	A7	Adjust for maximum output. Repeat Steps 2, 3 and 4.

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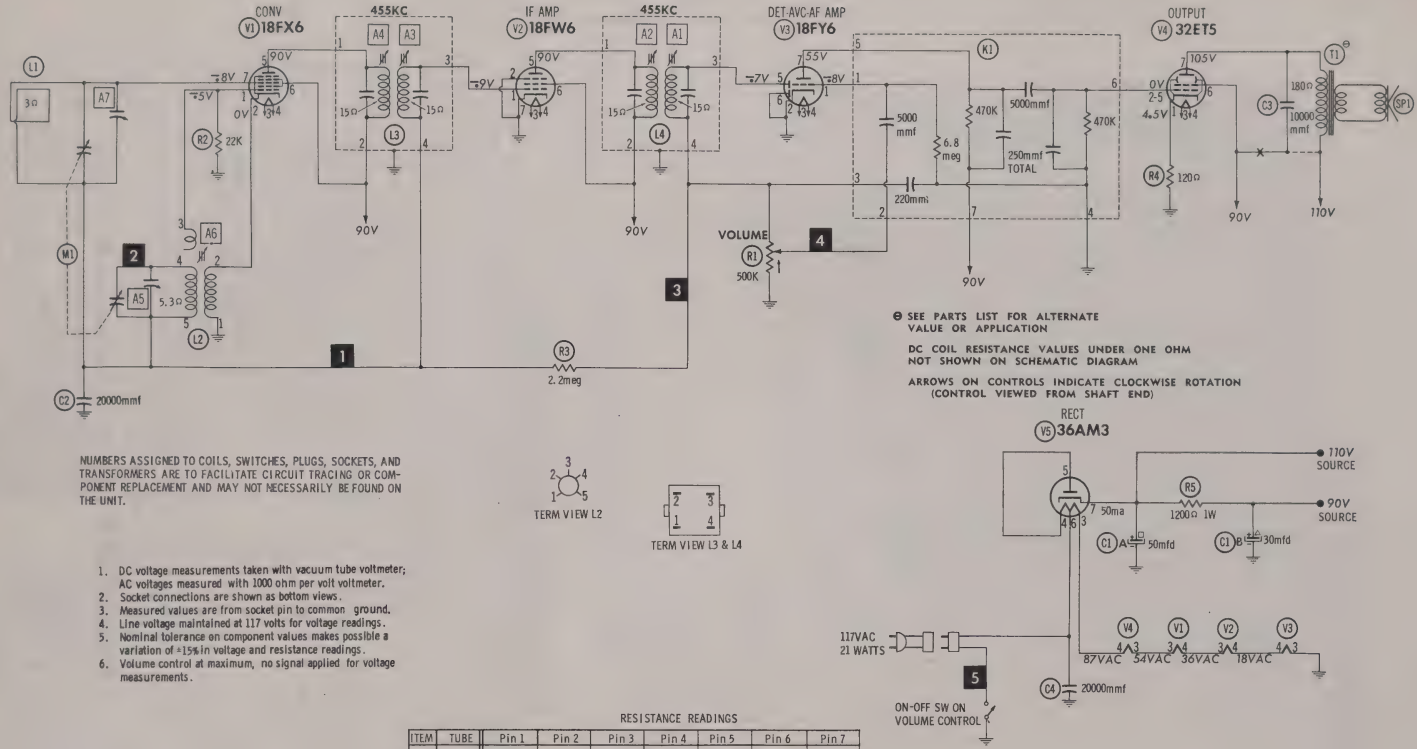
KG356

SET 524 FOLDER 5



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	18FX6	22K	0Ω	60Ω	40Ω	†1200Ω	†1200Ω	2.7meg
V2	18FW6	2.7meg	0Ω	40Ω	20Ω	†1200Ω	†1200Ω	0Ω
V3	18FY6	6.8meg	0Ω	0Ω	20Ω	500K	0Ω	†470K
V4	32ET5	120Ω	470K	60Ω	90Ω	NC	†1200Ω	†180Ω
V5	36AM3	TP	TP	90Ω	120Ω	120Ω	115Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. NC NO CONNECTION TP TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE'

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ARVIN MODELS 10R22, 10R27 (Ch. 1.49700, 1.49701)

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC)	TYPE (◆ RAYTHEON)	TYPE (◆ SYLVANIA)
V1	Converter	18FX6		
V2	IF Amplifier	18FW6		
V3	Det. -AVC-AF Amp.	18FY6		
V4	Output			32ET5
V5	Rectifier			36AM3

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	43711-9	PWH2-15-05	B0150 ‡	PFP213.1	TMD-2105 ♦	PCL-2432	
B	30	150							

‡ Use printed circuit adaptors #55277 & 55278.
♦ Use printed circuit adaptor kit TMA.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500K	½	45250-21					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	22K			
R3	2.2meg			
R4	120Ω			
R5	1200Ω 1W			

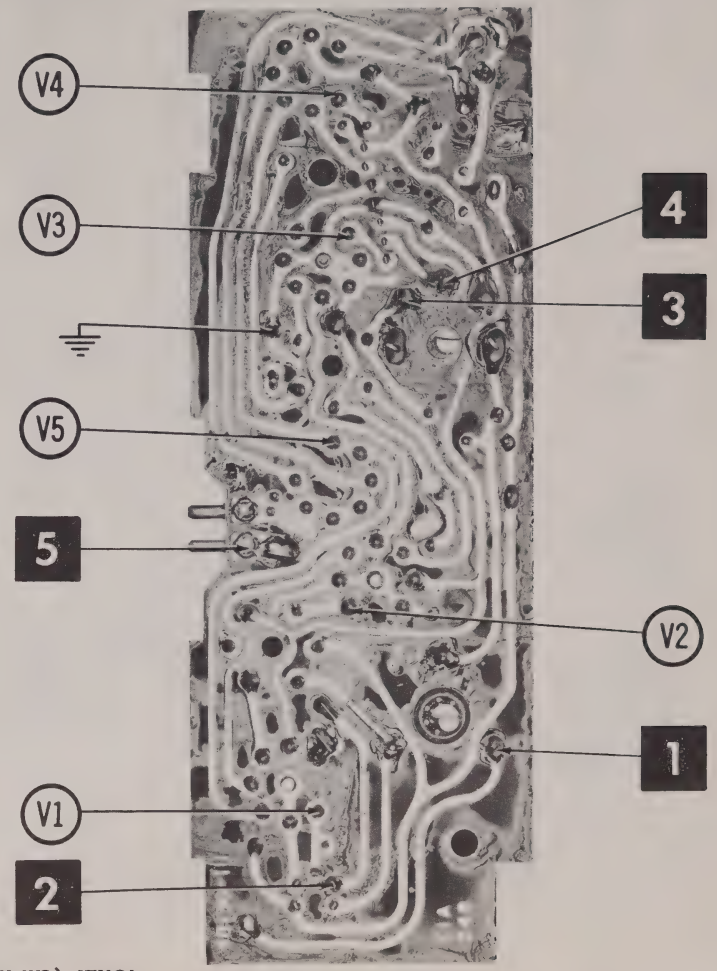
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ARVIN PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	43743-2	Aerovox PA-512-3 Centralab PC-158 Sprague DT-5

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



ARVIN MODELS 10R22, 10R27 (Ch. 1.49700, 1.49701)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ARVIN PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Loop Ant.	47960-1				
L2	Osc.	43644-1				
L3	Input IF	44282-1	BC-356	13-PC9	RTC-8683	
L4	Output IF	44282-1	BC-357	13-PC10	RTC-8684	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ARVIN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	3-4Ω	42700-20 *	A-3025	A-3332	24S53	S-12X	* Alternate Part #42700-21

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	45600-12	4A07	

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Tuning Cap.	47952-1	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

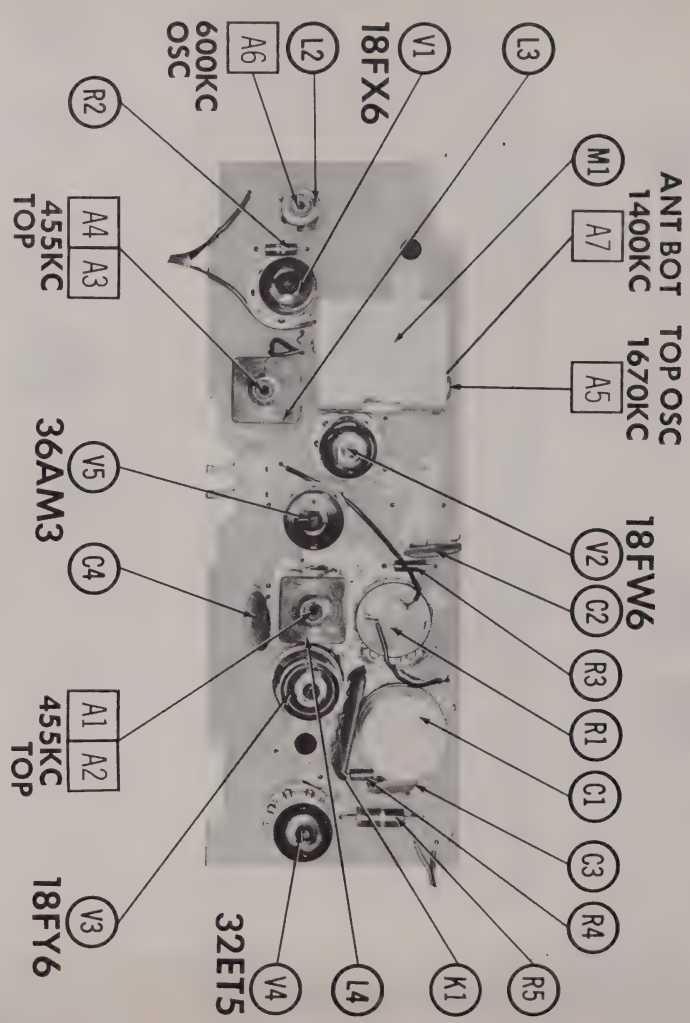
NAME	PART NO.	DESCRIPTION
Knob	47955	Tuning, White
Knob	47956	Volume, White
Cabinet	47969-42	Persimmon
Cabinet	47969-127	White Opal

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

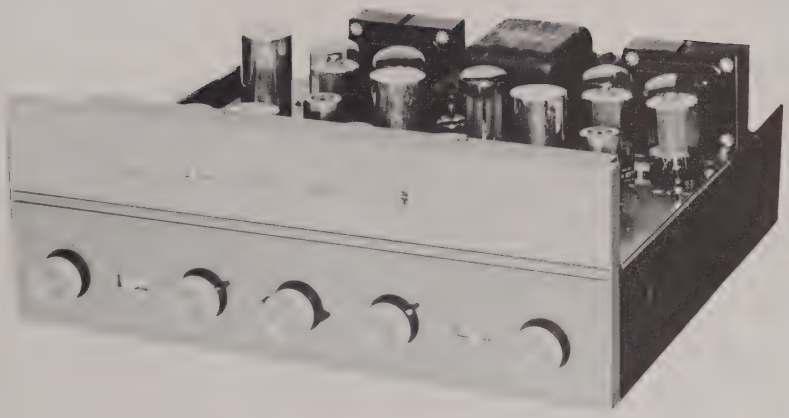
CHASSIS—TOP VIEW



PHOTOFACT® Folder

**BOGEN
MODEL DB230A**

**BOGEN
MODEL DB230A**



**BOGEN
MODEL DB230A**

TRADE NAME	Bogen Model DB-230A
MANUFACTURER	Bogen-Presto Co., A Div. of the Siegler Corp., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated 14 Tube Stereo Amplifier
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 115 Watts, 1 Amp. @117 Volts AC

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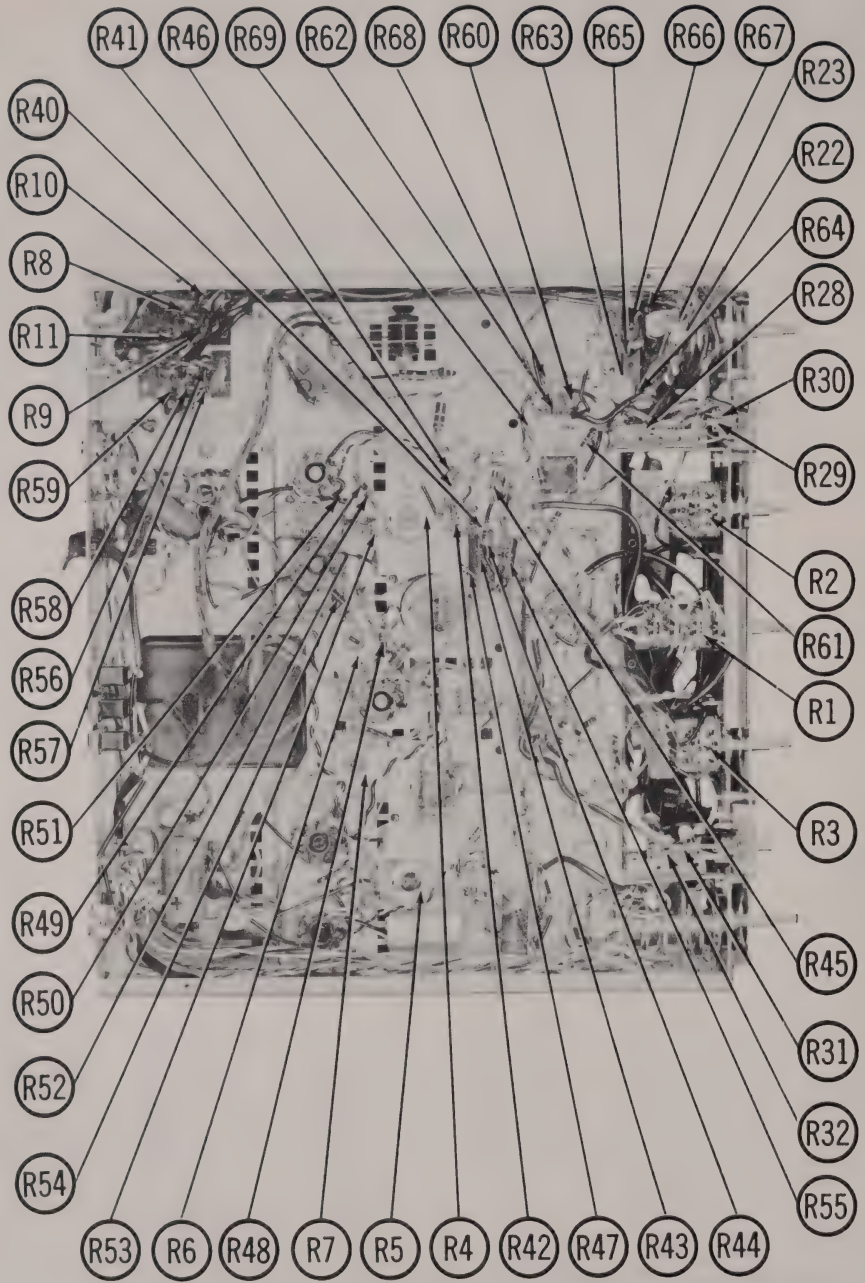
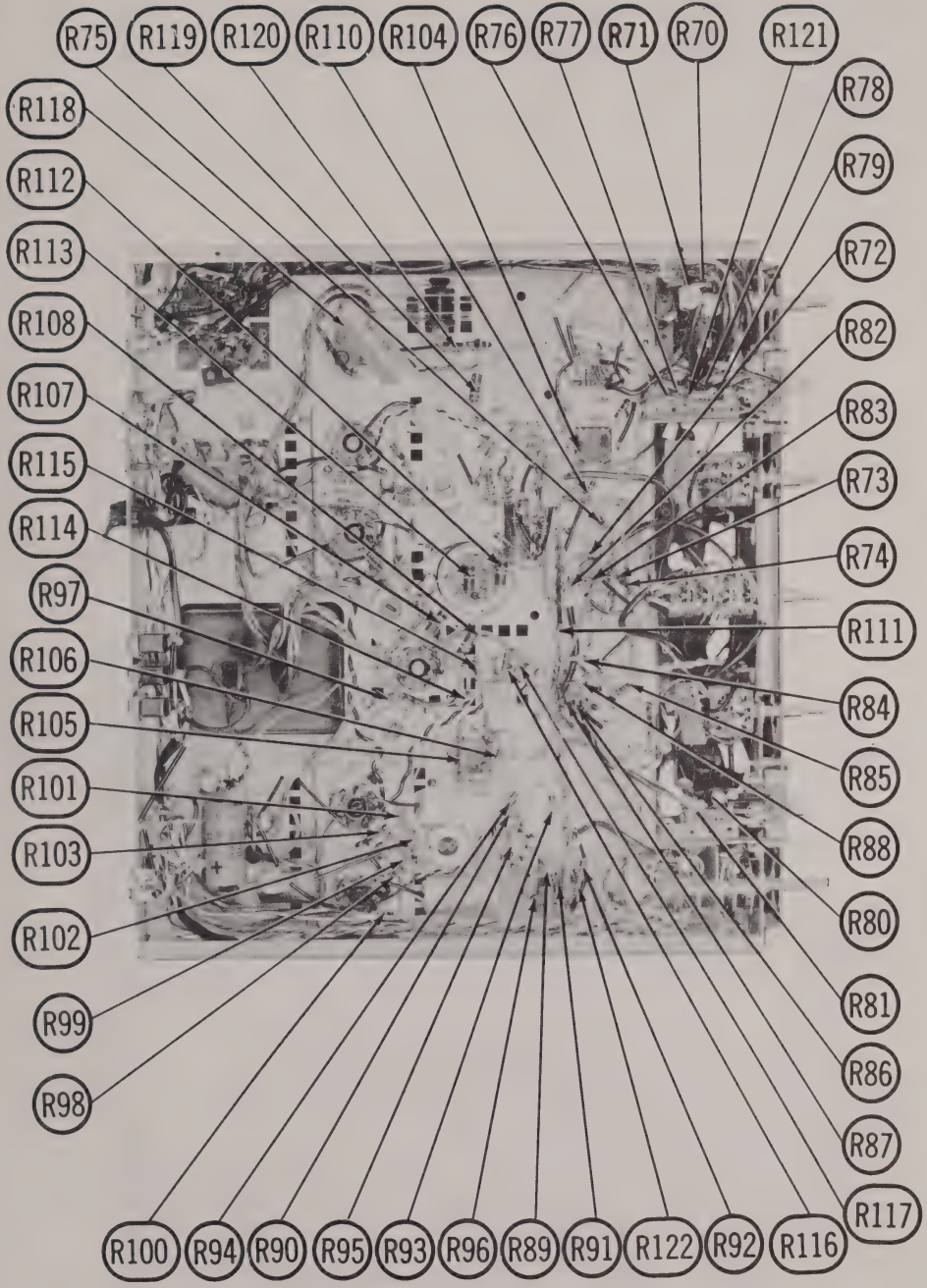
KV340



CHASSIS BOTTOM VIEW-RESISTOR IDENT.



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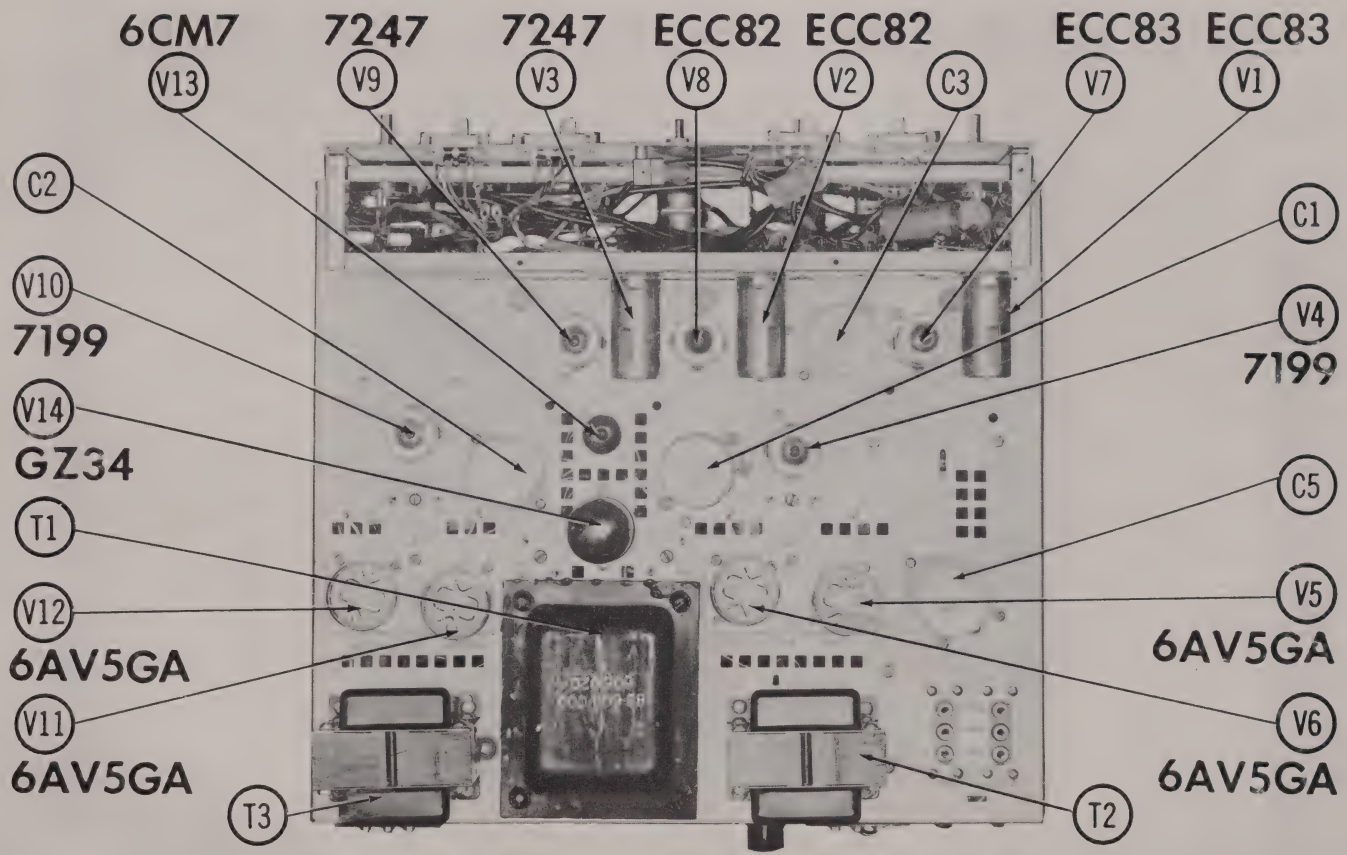
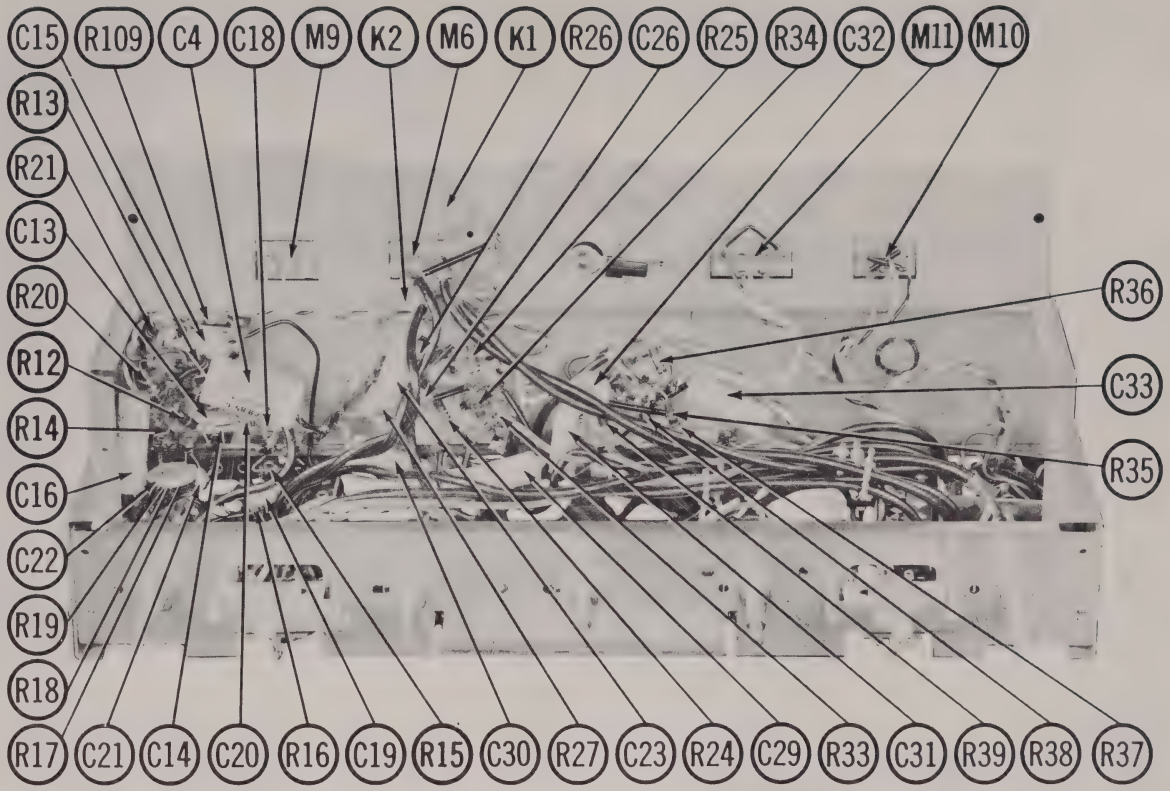


CHASSIS-TOP VIEW



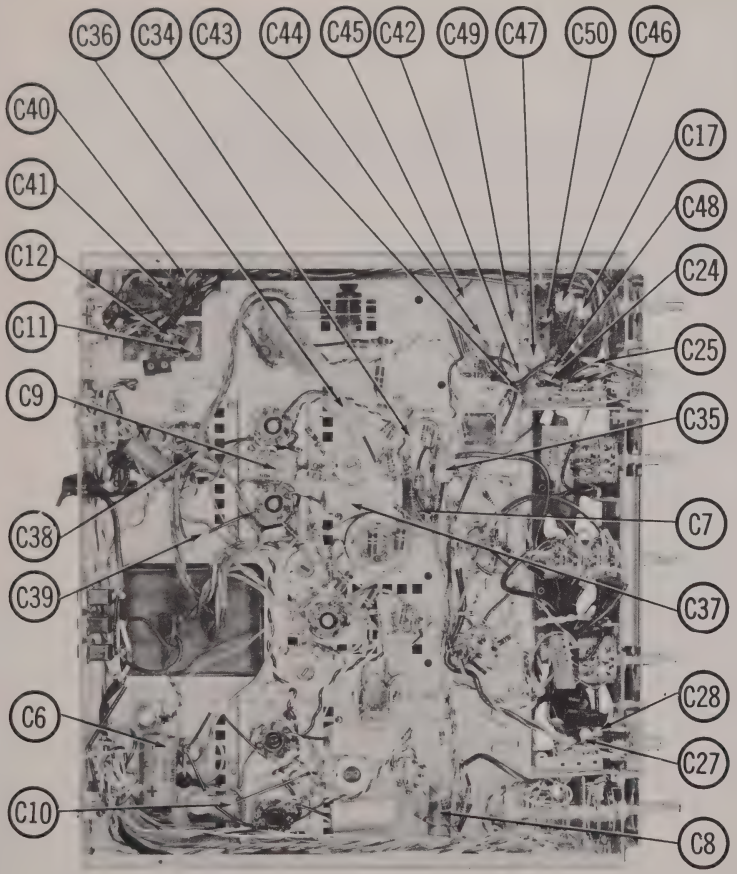
CONTROL PANEL-REAR VIEW

MODEL DB230A

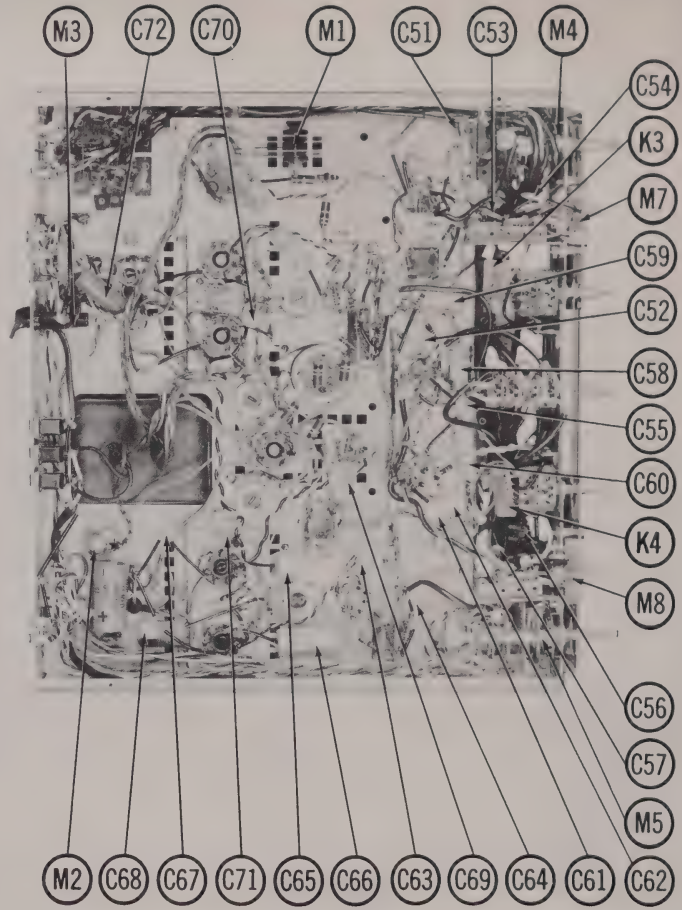
BOGEN

FOLDER 6

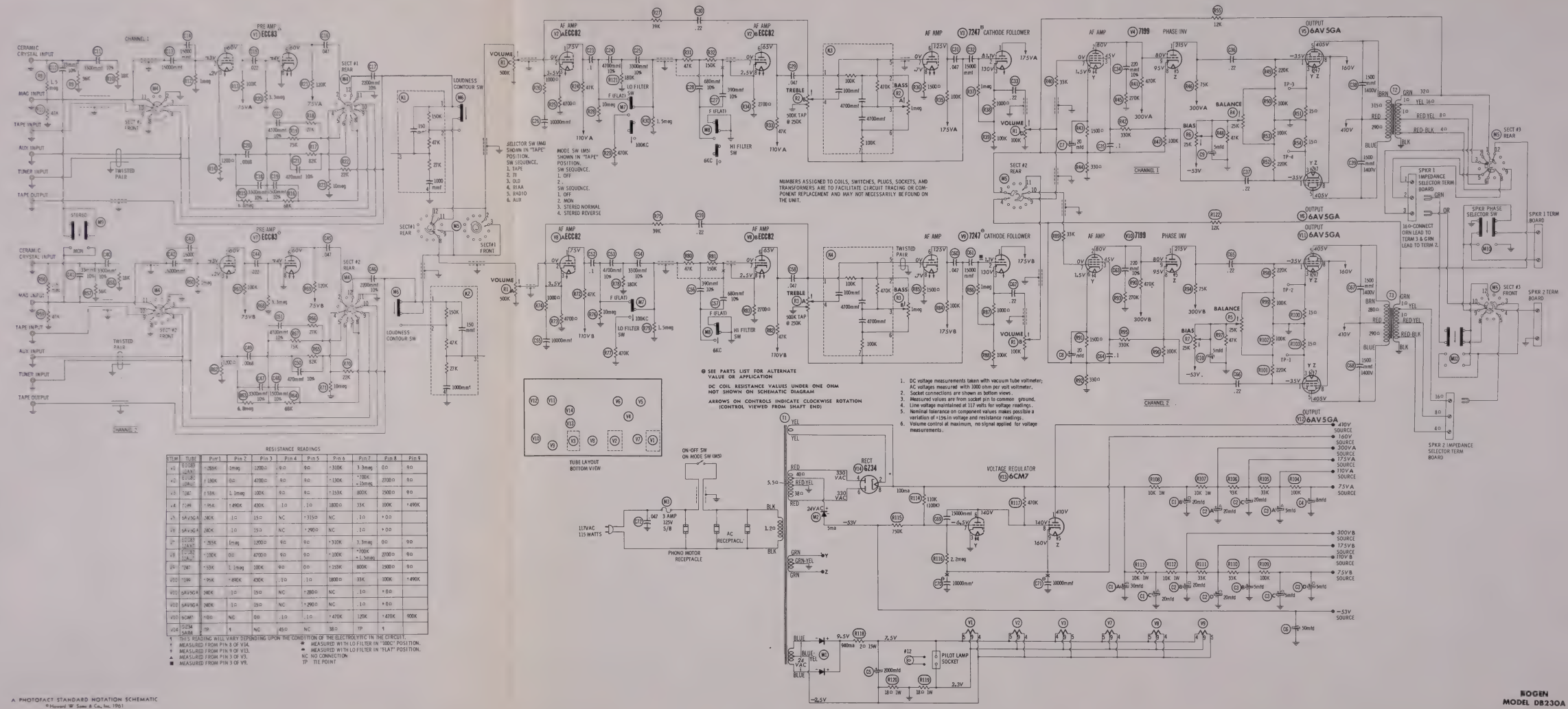
PAGE 5



CHASSIS BOTTOM VIEW-CAPACITOR IDENT.



CHASSIS BOTTOM VIEW-CAPACITOR & MISC. IDENT


CHANNEL 1
CERAMIC CRYSTAL INPUT
MAG INPUT
TAPE INPUT
AUX INPUT
TUNER INPUT
TAPE OUTPUT
PRE AMP V1 ECC83
SECT #1 REAR
SECT #1 FRONT
TWISTED PAIR
STEREO
LOUDNESS CONTOUR SW
VOLUME
AF AMP V2A ECC82
AF AMP V2B ECC82
AF AMP V3 7247 CATHODE FOLLOWER
AF AMP V4 7199 PHASE INV
OUTPUT V5 6AV5GA
SECT #2 REAR
SECT #2 FRONT
SECT #3 REAR
SECT #3 FRONT
TREBLE
BASS
BALANCE
BIAS
HI FILTER SW
LO FILTER SW
SELECTOR SW (M4) SHOWN IN "TAPE" POSITION. SW SEQUENCE. 1. TAPE 2. TU 3. OLD 4. RIAA 5. RADIO 6. AUX
MODE SW (M5) SHOWN IN "TAPE" POSITION. SW SEQUENCE. 1. OFF 2. - SW SEQUENCE. 1. OFF 2. MON 3. STEREO NORMAL 4. STEREO REVERSE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
CHANNEL 2
SPKR 1 IMPEDANCE SELECTOR TERM BOARD
SPKR PHASE SELECTOR SW
SPKR 1 TERM BOARD
SPKR 2 TERM BOARD
16Ω-CONNECT ORN LEAD TO TERM 3 & GRN LEAD TO TERM 2
SPKR 2 IMPEDANCE SELECTOR TERM BOARD
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±1% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.
TUBE LAYOUT BOTTOM VIEW
ON-OFF SW ON MODE SW (M5)
117VAC 115 WATTS
PHONO MOTOR RECEPTACLE
AC RECEPTACL
VOLTAGE REGULATOR V13 6CM7
RECT V14 6CZ4
PILOT LAMP SOCKET
410V SOURCE
160V SOURCE
300V A SOURCE
175V A SOURCE
110V A SOURCE
7.5V A SOURCE
300V B SOURCE
175V B SOURCE
110V B SOURCE
7.5V B SOURCE
-53V SOURCE

RESISTANCE READINGS

ITEM	TUBE	Part	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	*.25MΩ	1meg	1.25MΩ	0Ω	0Ω	*.310K	3.3meg	0Ω	0Ω
V2	ECC82 12AU7	*.130K	0Ω	47KΩ	0Ω	0Ω	*.130K	*.130K + 15meg	270Ω	0Ω
V3	7247	*.53K	1.1meg	100K	0Ω	0Ω	*.153K	800K	150Ω	0Ω
V4	7199	*.95K	*.490K	430K	.1Ω	.1Ω	180Ω	33K	100K	*.490K
V5	6AV5GA	280K	.1Ω	15Ω	NC	*.315Ω	NC	.1Ω	*0Ω	
V6	6AV5GA	280K	.1Ω	15Ω	NC	*.290Ω	NC	.1Ω	*0Ω	
V7	ECC83 12AX7	*.25K	1meg	1.25MΩ	0Ω	0Ω	*.310K	3.3meg	0Ω	0Ω
V8	ECC82 12AU7	*.130K	0Ω	47KΩ	0Ω	0Ω	*.130K	*.700K + 1.5meg	270Ω	0Ω
V9	7247	*.53K	1.1meg	100K	0Ω	0Ω	*.153K	800K	150Ω	0Ω
V10	7199	*.95K	*.490K	430K	.1Ω	.1Ω	180Ω	33K	100K	*.490K
V11	6AV5GA	280K	.1Ω	15Ω	NC	*.280Ω	NC	.1Ω	*0Ω	
V12	6AV5GA	280K	.1Ω	15Ω	NC	*.290Ω	NC	.1Ω	*0Ω	
V13	6CM7	*0Ω	NC	0Ω	.1Ω	.1Ω	*.470K	120K	*.470K	900K
V14	6CZ4 5AR4	1Ω	1	NC	45Ω	NC	38Ω	TP	1	

1 THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* MEASURED FROM PIN 3 OF V14.
+ MEASURED FROM PIN 9 OF V13.
▲ MEASURED FROM PIN 3 OF V3.
■ MEASURED FROM PIN 3 OF V9.
* MEASURED WITH LO FILTER IN "100C" POSITION.
- MEASURED WITH LO FILTER IN "FLAT" POSITION.
NC NO CONNECTION
TP TIE POINT

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ROGEN MODEL DB230A

ADJUSTMENTS

BALANCE AND BIAS ADJUSTMENTS

If an output tube is replaced or interchanged, that channel should be rebalanced. The following procedure is for Channel 2. When adjusting Channel 1, substitute TP-3 and TP-4 for TP-1 and TP-2.

1. Turn Balance Adj. to mid-range and Bias Adj. fully clockwise.
2. With VTVM set for low DC voltage, connect the DC probe to TP-1, common to chassis.
3. Adjust Bias Adj. for .25V DC.
4. Connect the DC probe of VTVM to TP-2. Readjust Bias Adj. for .25V DC.
5. Connect VTVM from TP-2 to TP-1. Adjust Balance Adj. for zero volts.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Channel 1 Preamp.	ECC83/12AX7 (7025) *
V2	Channel 1 AF Amp.	ECC82/12AU7
V3	Channel 1 AF Amp. - Cathode Follower	7247 (12DW7) *
V4	Channel 1 AF Amp. - Channel 1 Phase Inv.	7199
V5	Channel 1 Output	6AV5GA
V6	Channel 1 Output	6AV5GA
V7	Channel 2 Preamp.	ECC83/12AX7 (7025) *
V8	Channel 2 AF Amp.	ECC82/12AU7
V9	Channel 2 AF Amp. - Cathode Follower	7247 (12DW7) *
V10	Channel 2 AF Amp. - Channel 2 Phase Inv.	7199
V11	Channel 2 Output	6AV5GA
V12	Channel 2 Output	6AV5GA
V13	Voltage Regulator	6CM7
V14	Rectifier	GZ34/5AR4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	30	500		AFH3-52	C0390	FP399.5	TMT-3859	TVL-3956	
B	20	500							
C	20	500		AFH4-14	D0130	FP444	TMQ-4616	TVL-4763	
C2A	20	350							
B	20	350							
C	20	350							
D	20	350							
C3A	5	450	79-010-005	AFH4-09	D0080	WP433.6	TMQ-4607	TVL-4759.7	
B	5	450							
C	5	450							
D	5	450							
C4	8	250	79-001-096	PRS1555	BRR8-250	TC51	TD-8-250	TVA-1503	
C5	2000	15		AFH1-03	A0070	WP041	TMS-1050	TVL-1168	
C6	50	150	79-001-066	PRS1480	BR5015	TC49	TD-50-150	TVA-1414	
C7	20	50	79-001-056	PRS1330	BBR20-150	TC45	TD-20-150	TVA-1305.5	
C8	20	50	79-001-056	PRS1330	BBR20-150	TC45	TD-20-150	TVA-1305.5	
C9	5	200	79-001-086	PRS1550	BBR4-250	TC50X	TD-4-250	TVA-1501	
C10	5	200	79-001-086	PRS1550	BBR4-250	TC50X	TD-4-250	TVA-1501	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C11	3300 10%		DI-3300			CCD-332	JL-233	10TS-D33
C12	33 10%		DI-33	DD-330	L10Q33	CCD-330	GP433	10TS-Q33
C13	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C14	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C15	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C16	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	2200 10%		DI-2200			CCD-222	GP222	10TS-D22
C18	3300 10%		DI-3300			CCD-332	JL-233	10TS-D33
C19	1500 10%		DI-1500	DD-152		CCD-152	GP215	10TS-D15
C20	.0068 400V		P488N-0068	D6-682	CUB6D68	6DP-15682	GEM-6268	6TM-D68
C21	470 10%		DI-470	DD-471		CCD-471	GP347	10TS-T47
C22	4700 10%		DI-4700			CCD-472	JL-247	10TS-D47
C23	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C24	4700 10%		DI-4700			CCD-472	JL-247	10TS-D47
C25	3300 10%		DI-3300			CCD-332	JL-233	10TS-D33
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C27	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C28	680 10%		DI-680	DD-681		CCD-681	GP368	10TS-T68
C29	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C30	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C31	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C32	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C33	22 200V		P288N-22		CUB2P22	4DP-4-224	GEM-2022	2TM-P22
C34	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C35	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C36	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C37	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C38	1500 1400V		HVD-15-1500	DD30-152	HVC16D15			2HV-215	30GA-D15
C39	1500 1400V		HVD-15-1500	DD30-152	HVC16D15			2HV-215	30GA-D15
C40	3300 10%		DI-3300			CCD-332	JL-233	10TS-D33
C41	33 10%		DI-33	DD-330	L10Q33	CCD-330	GP433	10TS-Q33
C42	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C43	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C44	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C45	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C46	2200 10%		DI-2200			CCD-222	GP222	10TS-D22
C47	3300 10%		DI-3300			CCD-332	JL-233	10TS-D33
C48	1500 10%		DI-1500	DD-152		CCD-152	GP215	10TS-D15
C49	.0068 400V		P488N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C50	470 10%		DI-470	DD-471		CCD-471	GP347	10TS-T47
C51	4700 10%		DI-4700			CCD-472	JL-247	10TS-D47
C52	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C53	4700 10%		DI-4700			CCD-472	JL-247	10TS-D47
C54	3300 10%		DI-3300			CCD-332	JL-233	10TS-D 33
C55	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C56	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C57	680 10%		DI-680	DD-681		CCD-681	GP368	10TS-T68
C58	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C59	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C60	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C61	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C62	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C63	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C64	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C65	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C66	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C67	1500 1400V		HVD-15-1500	DD30-152	HVC16D15		2HV-215	30GA-D15
C68	1500 1400V		HVD-15-1500	DD30-152	HVC16D15		2HV-215	30GA-D15
C69	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C70	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C71	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C72	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	1/2	77-001-468					Volume, Channel 2
B	100K	1/2						Volume, Channel 2
C	500K	1/2						Volume, Channel 1
D	100K	1/2						Volume, Channel 1
R2A	1meg	1/2	77-001-371	F1-51				Bass, Channel 1
B	500K	1/2		R2-46		†QJ-1512R	■ UE3626	Treble, Channel 1
	250K Tap							
R3A	1meg	1/2	77-001-371	F1-51				Bass, Channel 2
B	500K	1/2		R2-46		†QJ-1512R	■ UE3626	Trebie, Channel 2
	250K Tap							
R4A	25K	1/2	77-001-410	TT-26	B47-25K-S	B11-120	TA253L	Balance Adj., Channel 1
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R5A	25K	1/2	77-001-410	TT-26	B47-25K-S	B11-120	TA253L	Balance Adj., Channel 2
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R6A	25K	1/2	77-001-410	TT-26	B47-25K-S	B11-120	TA253L	Bias Adj., Channel 1
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R7A	25K	1/2	77-001-410	TT-26	B47-25K-S	B11-120	TA253L	Bias Adj., Channel 2
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

† "CONCENTRIKIT" equivalent: K-6 Kit with base elements & shafts: B11-137, P17-102 (Panel) B19-133X, R1-111 (Rear)
(Not available as a factory assembled unit).
■ "STA-LOC" equivalent: FA16L, RU55T254, OF1062. IS1437.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R8	1.5meg				R65	82K			
R9	56K				R66	27K			
R10	18K				R67	75K			
R11	47K				R68	3.3meg			
R12	1meg				R69	120K			
R13	100K				R70	22K			
R14	1200Ω				R71	10meg			
R15	6.8meg				R72	47K			
R16	68K				R73	4700Ω			
R17	82K				R74	1000Ω			
R18	27K				R75	39K			
R19	75K				R76	10meg			
R20	3.3meg				R77	470K			
R21	120K				R78	180K			
R22	22K				R79	1.5meg			
R23	10meg				R80	47K			
R24	47K				R81	150K			
R25	4700Ω				R82	47K			
R26	1000Ω				R83	2700Ω			
R27	39K				R84	100K			
R28	10meg				R85	1500Ω			
R29	470K				R86	1meg			
R30	1.5meg				R87	1000Ω			
R31	47K				R88	100K			
R32	150K				R89	33K			
R33	47K				R90	470K			
R34	2700Ω				R91	1500Ω			
R35	100K				R92	330Ω			
R36	1500Ω				R93	270K			
R37	1meg				R94	75K			
R38	1000Ω				R95	330K			
R39	100K				R96	100K			
R40	33K				R97	47K			
R41	470K				R98	220K			
R42	330K				R99	100K			
R43	1500Ω				R100	15Ω			
R44	330Ω				R101	220K			
R45	270K				R102	100K			
R46	75K				R103	15Ω			
R47	100K				R104	100K			
R48	47K				R105	33K			
R49	220K				R106	33K			
R50	100K				R107	10K 1W			
R51	15Ω				R108	10K 1W			
R52	220K				R109	100K			
R53	100K				R110	33K			
R54	15Ω				R111	33K			
R55	12K				R112	10K 1W			
R56	1.5meg				R113	10K 1W			
R57	56K				R114	110K			(100K) *
R58	18K				R115	750K			
R59	47K				R116	2.2meg			
R60	1meg				R117	470K			
R61	100K				R118	2Ω 15W			
R62	1200Ω				R119	18Ω 1W			
R63	6.8meg				R120	18Ω 1W			
R64	68K				R121	180K			
					R122	12K			

* Alternate Value.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BOGEN PART No.	REPLACEMENT DATA
K1	Tone Compensation	150mmf, 10000mmf, 27K, 47K, 150K	78-906-001	Centralab PC-345 Sprague TC-8
K2	Tone Compensation	150mmf,10000mmf, 27K, 47K, 150K	78-906-001	Centralab PC-345 Sprague TC-8
K3	Tone Compensation	100mmf, 4700mmf, 4700mmf, 100K, 100K, 470K	78-900-001	Centralab PC-190 Sprague TC-1
K4	Tone Compensation	100mmf, 4700mmf, 4700mmf, 100K, 100K, 470K	78-900-001	Centralab PC-190 Sprague TC-1

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA BOGEN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI	SEC. 1	SEC. 2						
T1	117V @ 1A	660VCT @ .1ADC Tap @ 45V @ .005ADC	5V @ 1.9A	83-609-000					
	SEC. 3	SEC. 4	SEC. 5						
	6.3VCT @ 6.4A	24VCT @ .940A DC							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA BOGEN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC.						
T2	7500Ω CT	32Ω Tap @ 16Ω, 8Ω, 4Ω	83-290-010					
T3	7500Ω	32Ω Tap @ 16Ω, 8Ω, 4Ω	83-290-000					

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BOGEN PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.940A	H550 *		5N33-1C1-RV		* Dual Selenium
M2	.005A	H373 ♦		65A		♦ Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BOGEN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	3A 125V S/B			313003 (3AG 3A 125V) S/B	342001	MDX3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	BOGEN PART No.	NOTES
M4	Switch	81-001-470	Input Selector (Rotary Wafer Type)
M5	Switch	81-001-495	Mode (Rotary Wafer Type)
M6	Switch	81-003-002	Loudness Contour (DPDT Slide Type)
M7	Switch	81-003-009	Lo Filter (DPDT Slide Type)
M8	Switch	81-003-009	Hi Filter (DPDT Slide Type)
M9	Switch	81-003-002	Mono-Stereo (DPDT Slide Type)
M10	Switch	81-003-002	Phase (DPDT Slide Type)
M11	Switch	81-003-001	Speaker Selector (DPTT Slide Type)

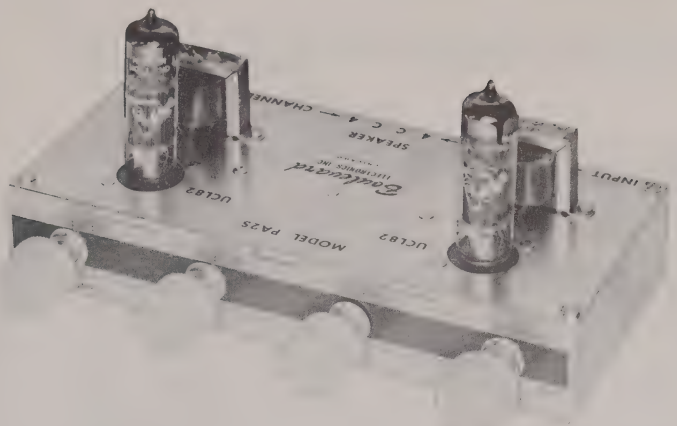
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

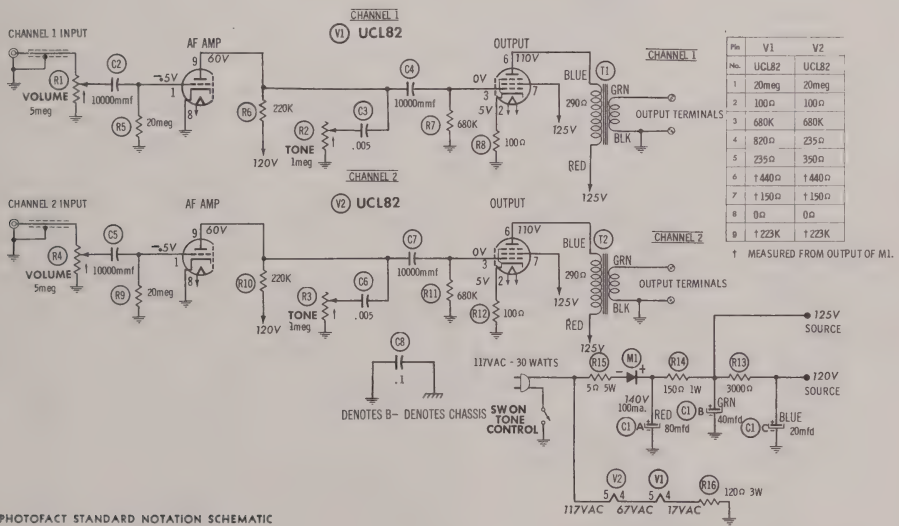
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

BOULEVARD
MODEL PA2S



TRADE NAME	Boulevard Model PA2-S
MANUFACTURER	Boulevard Electronics, Inc., 1229 W. Washington Blvd., Chicago 7, Illinois
TYPE SET	AC-DC Operated 2 Tube Stereo Amplifier
POWER SUPPLY	110 – 120 Volts AC-DC RATING 30 Watts, .4 Amp. @ 117 Volts AC



Pin No.	V1 UCL82	V2 UCL82
1	20meg	20meg
2	100Ω	100Ω
3	680K	680K
4	820Ω	235Ω
5	235Ω	350Ω
6	†440Ω	†440Ω
7	†150Ω	†150Ω
8	0Ω	0Ω
9	†223K	†223K

† MEASURED FROM OUTPUT OF M1.

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BOULEVARD
MODEL PA2S
BOULEVARD
MODEL PA2S
SET 524 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 1 Output	UCL82	V2	Channel 2 AF Amp. - Channel 2 Output	UCL82

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BOULEVARD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150		PRS3800	BBRT84215	TCT3117	TDLT-7	TVA-3455	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C3	.005 100V		P288N-005	DD-502	CUB6D5	DP-1-502	GEM-425	6TM-D50
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	.005 100V		P288N-005	DD-502	CUB6D5	DP-1-502	GEM-425	6TM-D50
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BOULEVARD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5meg	½	BA811-2974	B-87	A47-5meg-S	Q11-141	U67	Volume, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	BA812-1236	B-69	A47-1meg-S	Q11-137	U54	Tone, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On
R3A	1meg	½	BA811-2879	B-69	A47-1meg-S	Q11-137	U54	Tone, Channel 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	5meg	½	BA811-2974	B-87	A47-5meg-S	Q11-141	U67	Volume, Channel 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

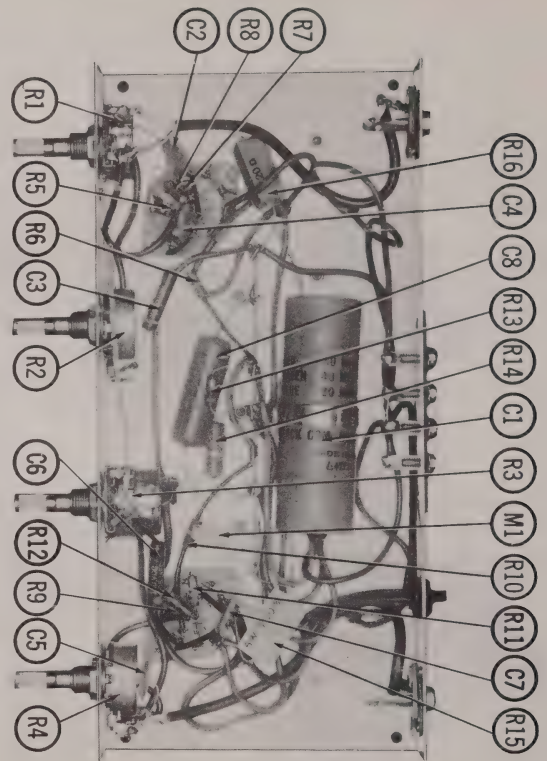
ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	20meg			
R6	220K			
R7	680K			
R8	100Ω			
R9	20meg			
R10	220K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R11	680K			
R12	100Ω			
R13	3000Ω			
R14	150Ω 1W			
R15	5.0Ω 5W	PW5-5.0Ω	5W-SQ-5Ω	
R16	120Ω 3W	PW5-120Ω	5W-SQ-120Ω	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA BOULEVARD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4000Ω	3-4Ω	38B524				S-41Z	
T2	4000Ω	3-4Ω	38B524				S-41Z	

CHASSIS—BOTTOM VIEW



POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BOULEVARD PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.100A		1N1763 *	2F4 *	SR200 *	* Silicon Type

WIRING DATA

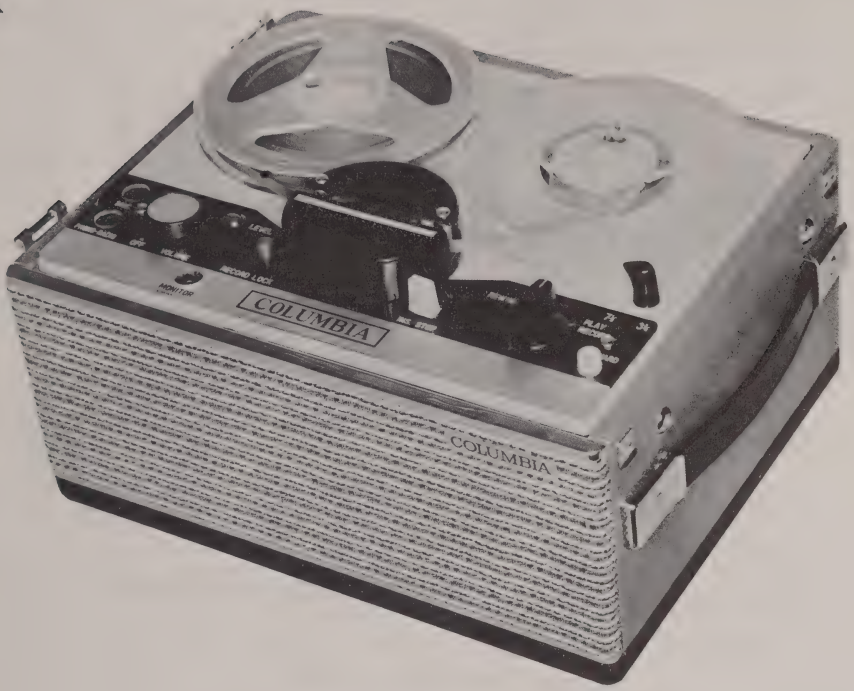
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

COLUMBIA
MODEL C690-TR

COLUMBIA
MODEL C690-TR



COLUMBIA
MODEL C690-TR

GENERAL INFORMATION

The Columbia Model C690-TR tape recorder is a two-speed tape recorder designed to play and record monaurally, two tracks on standard width recording tape.

Recordings may be made from a phonograph, radio, or television receiver as well as those made directly from the microphone.

The two tape speeds are 7 1/2 and 3 3/4 ips. Using both tracks, the recording and playing times are as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 hour	1/2 hour

This unit is designed to operate on 60 cycles, 110-120 volts, AC supply only.

Supplied By:

Columbia Phonographs
Dept. of CBS Electronics
405 Park Avenue
New York 22, N. Y.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of CQ451

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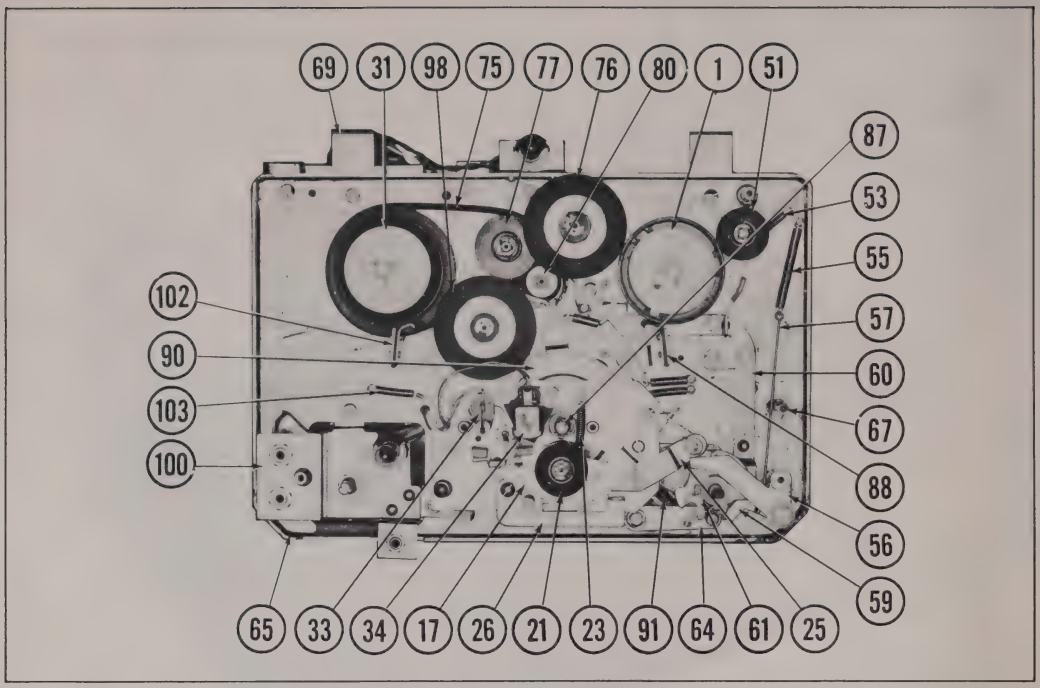
SET 524 FOLDER 8



TOP VIEW OF MECHANISM WITH DRESS PLATE REMOVED

FUNCTION OF CONTROLS

On-Off Volume

The On-Off-Volume control energizes the motor and amplifier circuits. The volume controls the recording level when the unit is in the Record mode.

Function Selector

This control selects the different modes of operation. Turning this control counterclockwise from the Stop position, places the unit in the Rewind mode. Turning this control clockwise, places the unit in the Play Record mode.

Record Lock

Depress the Record Lock button to place the unit in the Record mode when the Function Selector is moved to the Play/ Record position.

Forward Knob

The Forward knob winds the tape onto the takeup (right) reel. This is done by depressing the knob and moving the Function Selector to the Play Record position.

Instant Stop Key

The Instant Stop key allows the operator to stop the tape temporarily so as not to record unwanted portions such as commercials, etc.

Speed Change

Moving the speed change knob to the extreme counterclockwise position sets the motor speed for recording at 7 1/ 2 ips. When the knob is moved to the extreme clockwise position the motor speed is set for recording at 3 3/4 ips.

OPERATING INSTRUCTIONS

Threading The Tape

1. Place a reel of tape on supply (left) reel stand (31).
2. Place an empty reel on takeup (right) reel stand (1).
3. Unwind about 12" of tape from supply reel. Hold a section of tape taut and insert it in the tape slot. Make sure the dull coated side of tape faces the recording head.
4. Insert the free end of the tape into one of the

radial slots in the hub of the takeup reel. Turn the reel several turns counterclockwise to fasten the tape to the reel and to take up all slack between reels.

To Record From Microphone

1. Thread tape as described under "Threading the Tape".
2. Rotate the On-Off-Volume control clockwise to turn recorder on. Allow a sufficient time for tubes to warm up.
3. Insert the microphone plug into the "MIC" jack.
4. Set the speed change control for the desired recording speed.
5. Hold Record Lock knob down and move Function Selector to Play/ Record position.
6. Hold the microphone about 8 to 12 inches from your mouth and speak in a normal voice.
7. Adjust the volume control until the record level indicator flashes on the loudest sounds.

NOTE: Recordings may be monitored by placing a crystal earphone in the Monitor jack.

IMPORTANT: Correct volume level on recording is very important. Too weak of a signal will result in weak playback and high background noise. Too strong of a signal will result in overloading and distortion during playback.

Recording Radio Programs

Radio programs may be recorded by one of the following methods:

1. Microphone Pickup from Speaker of Radio — Place the microphone about 8 to 12 inches in front of the radio speaker. Turn the radio volume control to a normal level. Turn the radio tone control to treble or high. Set the recording level and record as under "To Record From Microphone".

2. Direct Connection to Radio Speaker — Using the accessory cable, connect the alligator clips across the voice coil terminals of the radio speaker. Insert the cable plug into the "Radio-speaker. Insert the cable plug into the "Radio-Phono" jack. Set the radio volume and tone controls as described in Step 1. Set the recording level and proceed as described under "To Record From Microphone".

3. Direct Connection to Volume Control of Radio — Using the accessory cable, connect the alligator clips across the radio volume control. Insert the cable plug into the "Radio-Phono" jack. Set the recording level and proceed as described under "To Record From Microphone". The setting of the radio volume and tone controls will have no effect on this setup.

To Record From Phonograph

A phone type plug is required on the phonograph pickup leads. Insert this plug into the "Radio-Phono" jack and proceed as described under "To Record From Microphone".

To Record From a Television Receiver

Use one of the methods described under "Recording Radio Programs".

Dual Track Recording

These recorders are designed to record and play back on one-half the width of the tape at a time, thereby, resulting in two track recording. After the recording is completed, and all tape is wound on the takeup (right) reel, remove reels from recorder. Turn the reels over and place full reel on left spindle. Properly thread tape and proceed with recording. After the second track has been recorded, the first track can be played back in the same manner.

Rewind

To rewind the tape, turn the Function Selector knob to the Rewind position.

To Play a Recording

1. Thread the tape as described under "Threading the Tape".
2. Turn Function Selector knob to the Play position.
3. Adjust the volume control to the desired listening level.

To Erase a Recording

Any recording on the tape is automatically erased before a new one is put on the tape when the unit is in the Record position. To erase a recording without putting anything on tape, follow normal recording procedure but leave microphone disconnected and volume control at a minimum.

To Edit And Splice Tape

NOTE: It is impossible to edit and splice one track without affecting the other. Recordings to be edited should be limited to one track recordings only.

Tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements can be inserted between selections, etc. Unused tape can be spliced for reuse.

For best results, cut tape at a slight diagonal, butt ends together and fasten on glossy side with splicing tape. Trim off any excess width.

DISASSEMBLY

To Remove Recorder From Case

1. Remove case cover.
2. Remove screws (2 each) from each side and rear of case.
3. Lift recorder up and away from case far enough so the speaker leads can be disconnected.
4. Lift entire unit from case.
5. Reverse above procedure to reassemble.

To Remove Amplifier From Tape Transport

1. Remove the hex nut from the On-Off-Volume controls and remove the control.
2. Remove the hex nuts from the Microphone, Radio-Phono, and Monitor jacks. Remove the jacks.
3. Remove the record level and ready lights from their mountings.
4. Disconnect the motor leads from the power transformer.
5. Disconnect the Record Playback and erase head wires.
6. Remove the three screws holding the tape transport to the amplifier chassis brackets.
7. Remove the tape transport from the amplifier chassis.
8. To reassemble, reverse above procedure.

CLEANING

Pressure roller (21), capstan shaft (87), tape guides (44), erase head (33), and play-record head (34) may accumulate tape oxide coating, worn off the tape as it passes these parts. This accumulation will cause poor performance and should be removed with a soft lint-free cloth dipped in alcohol.

LUBRICATION

Under normal operation, the mechanism should be lubricated once every three months. All bearing surfaces should be lubricated with a good grade of oil. Lubricate the cams and levers with a non-hardening grease. Make sure no oil or grease gets on the rubber surfaces of the drive wheels.

HEAD ADJUSTMENT

The Play-Record head (34) and the erase head (33) are aligned at the factory. The heads should not need adjustment unless they are replaced.

Play-Record Head

The top edge of the Play-Record head (34) must be set evenly with top edge of tape. Thread tape on recorder and adjust head by moving spring loaded screws (36) up or down to correct position. After adjusting head height, adjust rear screws (36) so that head is perpendicular to tape.

Erase Head

The erase head (33) should be adjusted so that the pole piece covers the top half of the tape. The face of the erase head should be as nearly perpendicular to tape as possible by visual alignment.

TROUBLE CHART

Symptom	Cause	Remedy
No record or playback.	1. Defective motor (74).	1. Replace motor (74).
	2. Defective idler wheel (98).	2. Replace idler wheel (98).
	3. Defective drive idler wheel (76).	3. Replace drive idler wheel (76).
	4. Broken spring (35).	4. Replace spring (35).
	5. Defective Play-Record head (34).	5. Replace Play-Record head (34).
	6. Broken pressure roller spring (23).	6. Replace pressure roller spring (23).
No Rewind.	1. Drive belt (75) broken.	1. Replace drive belt (75).

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
	2. Defective motor service pulley (80).	2. Replace motor service pulley (80).
No Erase.	1. Defective Erase head (33).	1. Replace Erase head (33).
Reel stands binding.	1. Broken brake spring (53) or (103).	1. Replace brake spring (53) or (103).
No Takeup.	1. Broken spring (92).	1. Replace spring (92).

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	690-1	Takeup Reel Stand
2	690-2	Set Screw
3	690-3	Screw
4	690-4	Head Cover
5	690-5	Set Screw
6	690-6	Set Screw
7	690-7	Speed Change Knob
8	690-8	Function Control Knob
9	690-9	Screw
10	690-10	Instant Stop Tab
11	690-11	Escutcheon
12	690-12	Screw
13	690-13	Dress Plate
14	690-14	Forward Knob
15	690-15	Spring Plate
16	690-16	Screw
17	690-17	Tape Pad Bracket
18	690-18	"C" Washer
19	690-19	Fibre Washer
20	690-20	Felt Washer
21	690-21	Pressure Roller
22	690-22	Washer
23	690-23	Pressure Roller Spring
24	690-24	Screw
25	690-25	Pressure Roller Bracket
26	690-26	Instant Stop Bracket
27	690-27	Screw
28	690-28	Plate
29	690-29	Hex Nut
30	690-30	Bushing
31	690-31	Supply Reel Stand
32	690-32	Volume Control Knob
33	690-33	Erase Head
34	690-34	Play-Record Head
35	690-35	Spring
36	690-36	Head Adjustment Screw
37	690-37	Head Mounting Plate
38	690-38	Screw
39	690-39	Spring
40	690-40	Hex Nut
41	690-41	Erase Head Bracket
42	690-42	Screw
43	690-43	Hex Nut
44	690-44	Tape Guide
45	690-45	"C" Washer
46	690-46	Fibre Washer
47	690-47	Upper Clutch
48	690-48	Felt Washer
49	690-49	Felt Washer
50	690-50	Lower Clutch
51	690-51	Tension Roller
52	690-52	Tension Roller Lever
53	690-53	Spring
54	690-54	Bushing
55	690-55	Spring
56	690-56	Lock Bracket
57	690-57	Rod
58	690-58	Spring
59	690-59	Tension Bracket
60	690-60	Slide Bracket
61	690-61	Function Cam
62	690-62	Spring
63	690-63	Record Control Bracket
64	690-64	Function Cam Lever
65	690-65	Base Plate
66	690-66	Pin
67	690-67	Speed Change Shaft
68	690-68	Speed Change Lever
69	690-69	Case Mounting Bracket
70	690-70	Motor Board Mount Sleeve
71	690-71	Grommet
72	690-72	Motor Board
73	690-73	Motor Mount Sleeve
74	690-74	Motor
75	690-75	Drive Belt
76	690-76	Drive Idler Wheel
77	690-77	Drive Pulley
78	690-78	Rewind Actuating Lever
79	690-79	Drive Idler Wheel Bracket
80	690-80	Motor Service Pulley
81	690-81	Idler Wheel Bracket
82	690-82	Drive Lever
83	690-83	Spring
84	690-84	Spring
85	690-85	Bracket
86	690-86	Idler Tension Bracket
87	690-87	Capstan Shaft
88	690-88	Right Brake Shoe Bracket
89	690-89	Spring
90	690-90	Flywheel
91	690-91	Spring
92	690-92	Spring
93	690-93	Spring
94	690-94	Speed Change Tension Spring
95	690-95	Spring Cap
96	690-96	Bolt
97	690-97	Supply Spindle Pulley Assembly
98	690-98	Idler Wheel
99	690-99	Hex Nut
100	690-100	Mounting Plate
101	690-101	Main Control Lever
102	690-102	Left Brake Shoe Bracket
103	690-103	Spring
104	690-104	Record Knob
105	690-105	Record Cam
106	690-106	Cam Stop

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)	ITEM No.	USE	TYPE
V1	Preamplifier	12AX7	V2	AF Amp. -Output-Bias Osc.	12BH7A

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP.	RATING VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▪20	300	16K476	AFH3-28-30	B0300	FP227	TMD-2295	TVL-3639.8	
B	▲20	300			BR1045	TC62	TD-10-450		
C	▲10	300							
C2	30	6	16K477	PTT-6030	NLW30-6	TT6X30	MLV30-6	TE-1092	
C3	25	25	16K478	PTT-25025	NLW25-25	TT25X25	MLV25-25	TE-1207	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.5 6V		P282Z-5		WMF1P47E	1DP-4-504	GEM-205	2PS-P50
C5	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C6	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C7	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C8	300 5%			TCZ-300	1R5D3	CM-19B-301J	MCE241	10TCC-T30
C9	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C10	.001 400V		P488N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C11	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C12	200 10%		NPO-SI 200	TCZ-200	5R5T2	CM-19B-201K	CNO-320	10TCC-T20
C13	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C14	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	9K671	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2	500K	½	9K672					Level

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	50K			
R4	1meg			
R5	2meg			
R6	250K			
R7	3000Ω			
R8	250K			
R9	500K			
R10	120K			
R11	50K			
R12	2500Ω			
R13	100K			
R14	1meg			
R15	150K			

ITEM No.	RATING	IRC PART No.	WORKMAN TV PART No.	REMARKS
R16	100K			
R17	200K			
R18	1meg			
R19	50K			
R20	30K 1W			
R21	3000Ω			
R22	250K			
R23	1000Ω			
R24	30K			
R25	10Ω			
R26	2000Ω 1W			
R27	30K			

COILS (RF-IF)

ITEM No.	USE	COLUMBIA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	Bias Osc.	20K434				

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	COLUMBIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T1	117V ⓐ .15A	230V ⓐ .015A	6.3V ⓐ 1A	3K272					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	COLUMBIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	12.5K	3-4Ω	3K273	A-2933①	A-3879①	24S98①	S-10X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	COLUMBIA PART No.	QUAM PART No.	NOTES
SP1	4"x 6"	PM	3-4Ω	1K181	46A1	

POWER RECTIFIERS

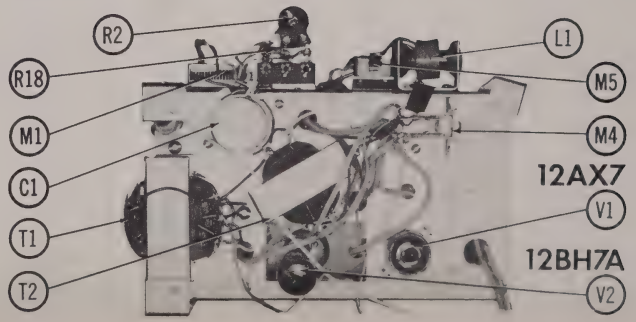
ITEM No.	RATING CURRENT (Measured)	COLUMBIA PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.015A	10K624 *				* Selenium

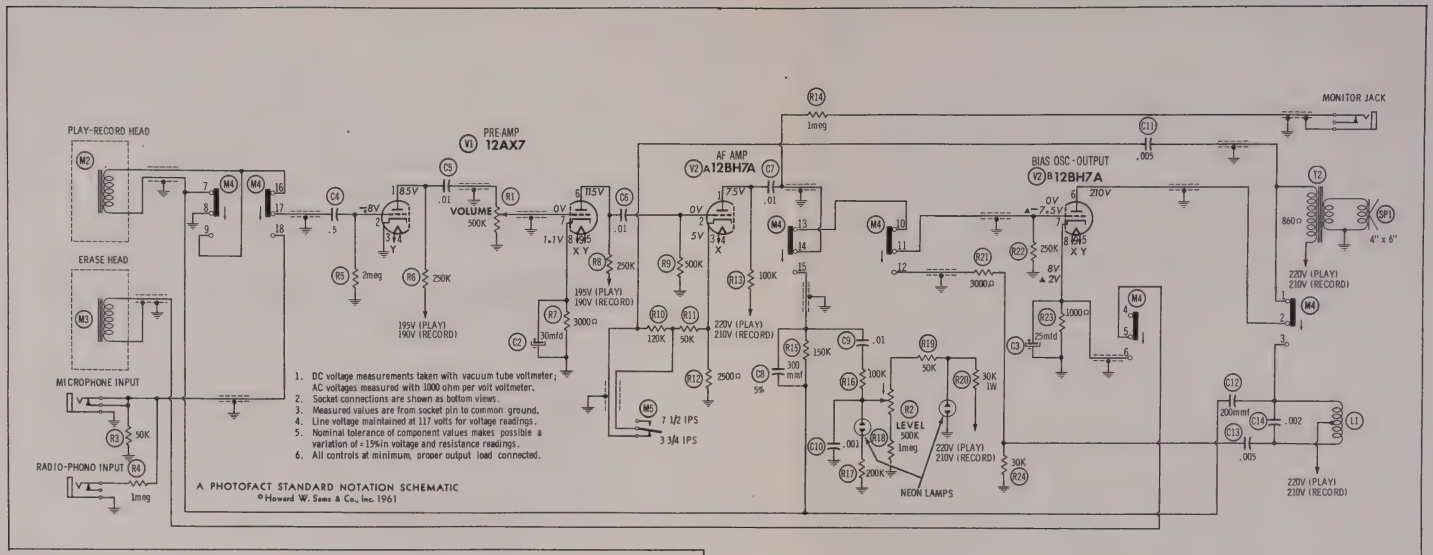
MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M2	Head	19K799	Play-Record
M3	Head	19K800	Erase
M4	Switch	19K801	Slide Switch (DPDT) Function Selector
M5	Switch	19K802	Speed Selector
M6	Motor	690-74	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)




PLAY-RECORD HEAD
ERASE HEAD
MICROPHONE INPUT
RADIO-PHONO INPUT
PRE-AMP
V1 12AX7
AF AMP
V2A 12BH7A
BIAS OSC - OUTPUT
V2B 12BH7A
MONITOR JACK
VOLUME
LEVEL
NEON LAMPS
SW ON VOLUME CONTROL
117VAC - 17 WATTS
7 1/2 IPS
3 3/4 IPS
195V (PLAY)
190V (RECORD)
220V (PLAY)
210V (RECORD)
4" x 6"
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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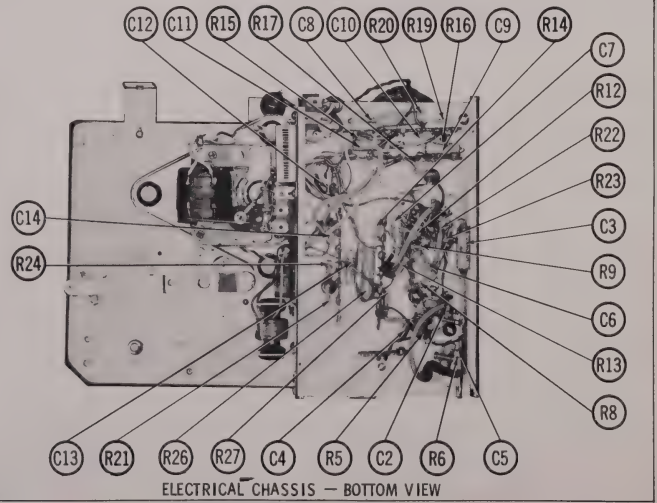
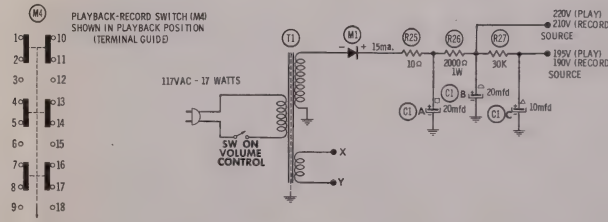

C12 C11 R15 R17 C8 C10 R20 R19 R16 C9 R14
C7 R12 R22 R23 C3 R9 C6 R13 R8
C14 R24
C13 R21 R26 R27 C4 R5 C2 R6 C5
ELECTRICAL CHASSIS — BOTTOM VIEW

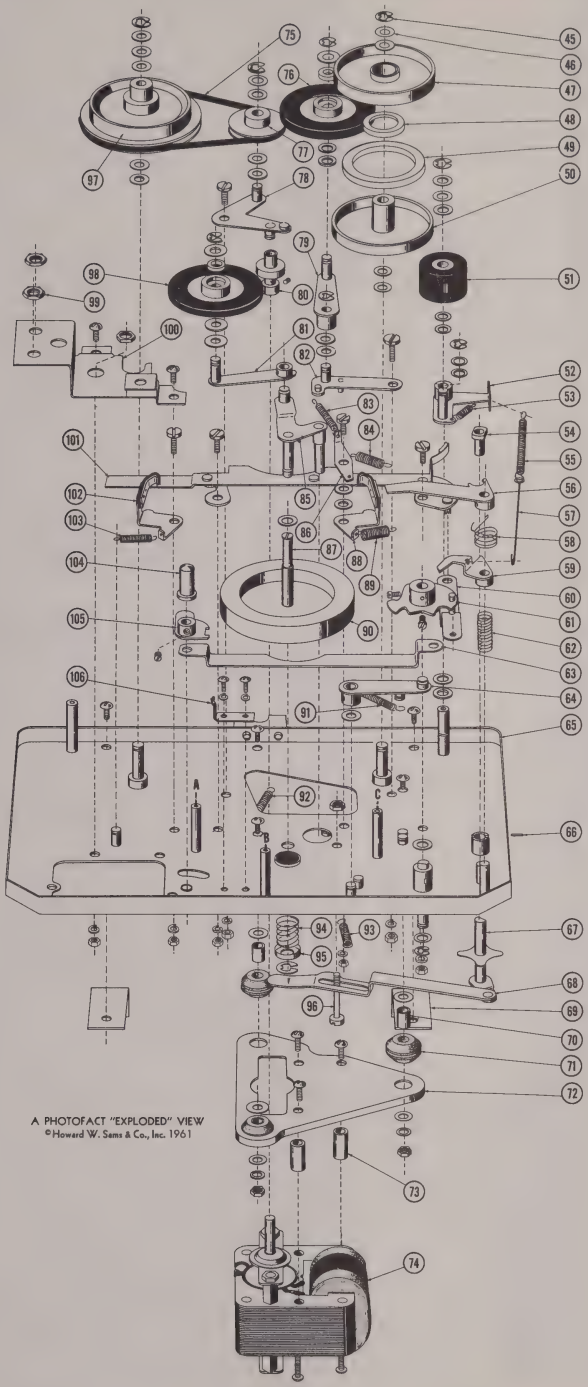


RESISTANCE READINGS

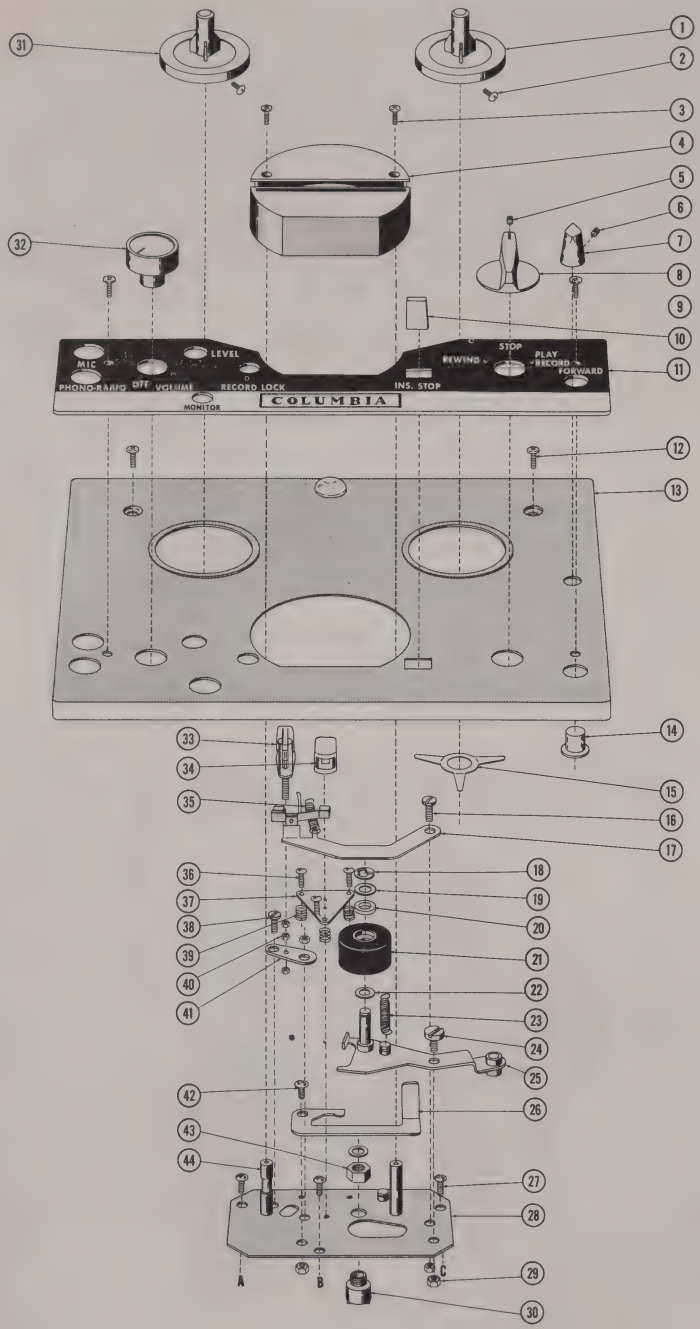
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†280K	2meg	0Ω	1Ω	1Ω	†280K	0Ω	3000Ω	NC
V2	12BH7A	†100K	500K	2500Ω	1Ω	1Ω	†3000Ω ▲†2100Ω	250K ▲33K	1000Ω ▲150Ω	NC

ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "RECORD" POSITION.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

COLUMBIA
MODEL C690-TR



EXPLODED VIEW OF PARTS BELOW BASE PLATE



A PHOTOFACT "EXPLODED" VIEW
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EXPLODED VIEW OF PARTS ABOVE BASE PLATE

PHOTOFACT® Folder with CIRCUITRACE®

CONTINENTAL MODEL TR-801

CONTINENTAL MODEL TR-801

TRADE NAME	Continental Model TR-801
IMPORTER	Continental Merchandise Co., Inc., 236 Fifth Ave., New York 1, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC — RATING 8MA@6 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC — 25MA@6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

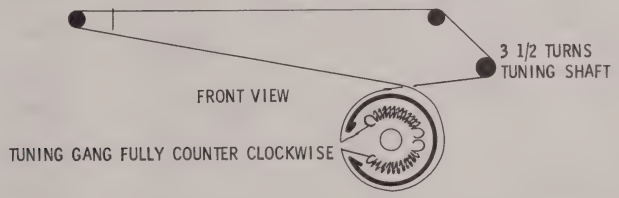
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A7..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	520KC	520KC	"	A4	"
3.	"	1680KC	1680KC	"	A5	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	600KC	600KC	"	A6	Adjust for maximum output.
5.	"	1400KC	1400KC	"	A7	Adjust for maximum output. Repeat Steps 4 and 5.

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KF394

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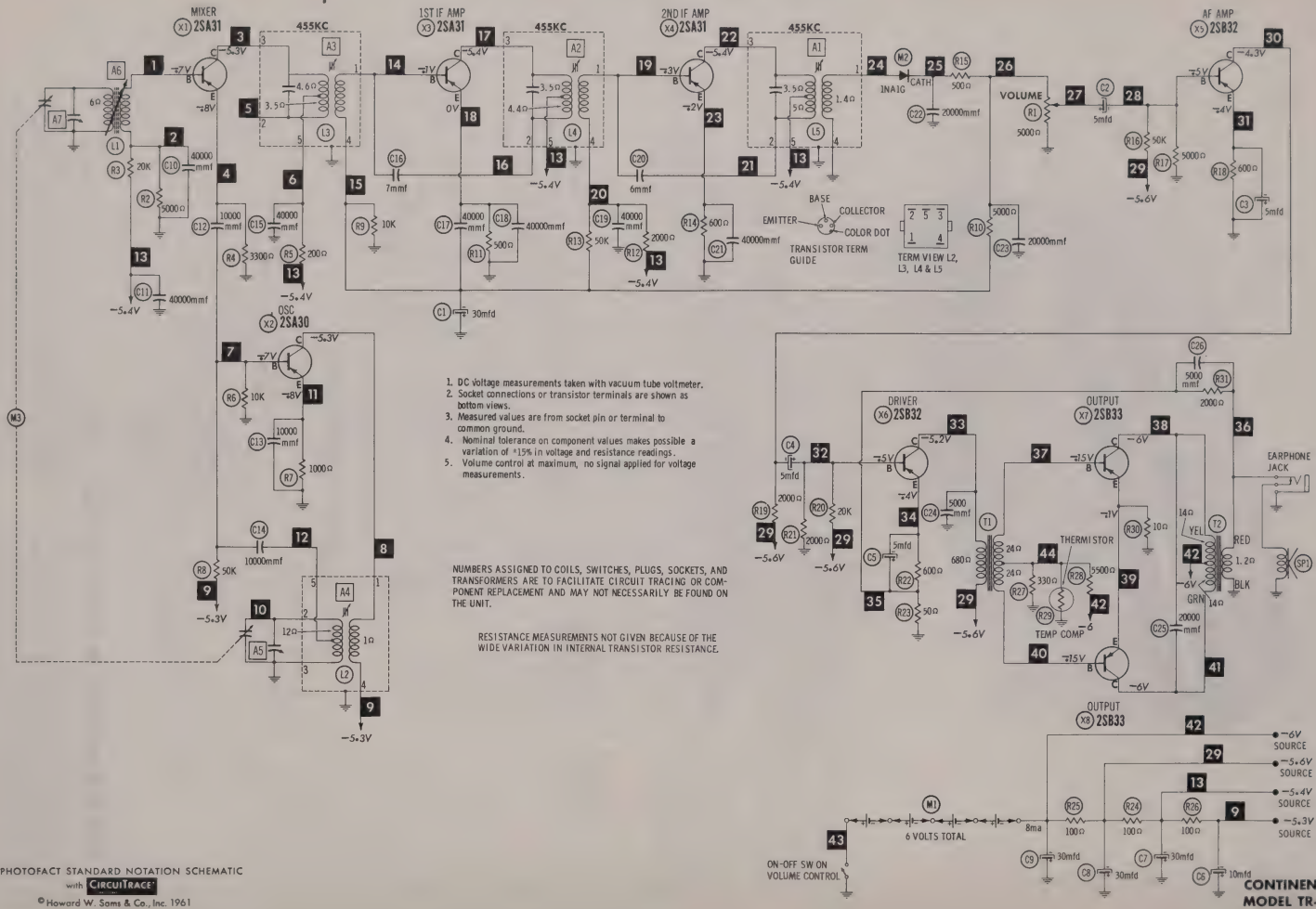
SET 524 FOLDER 9



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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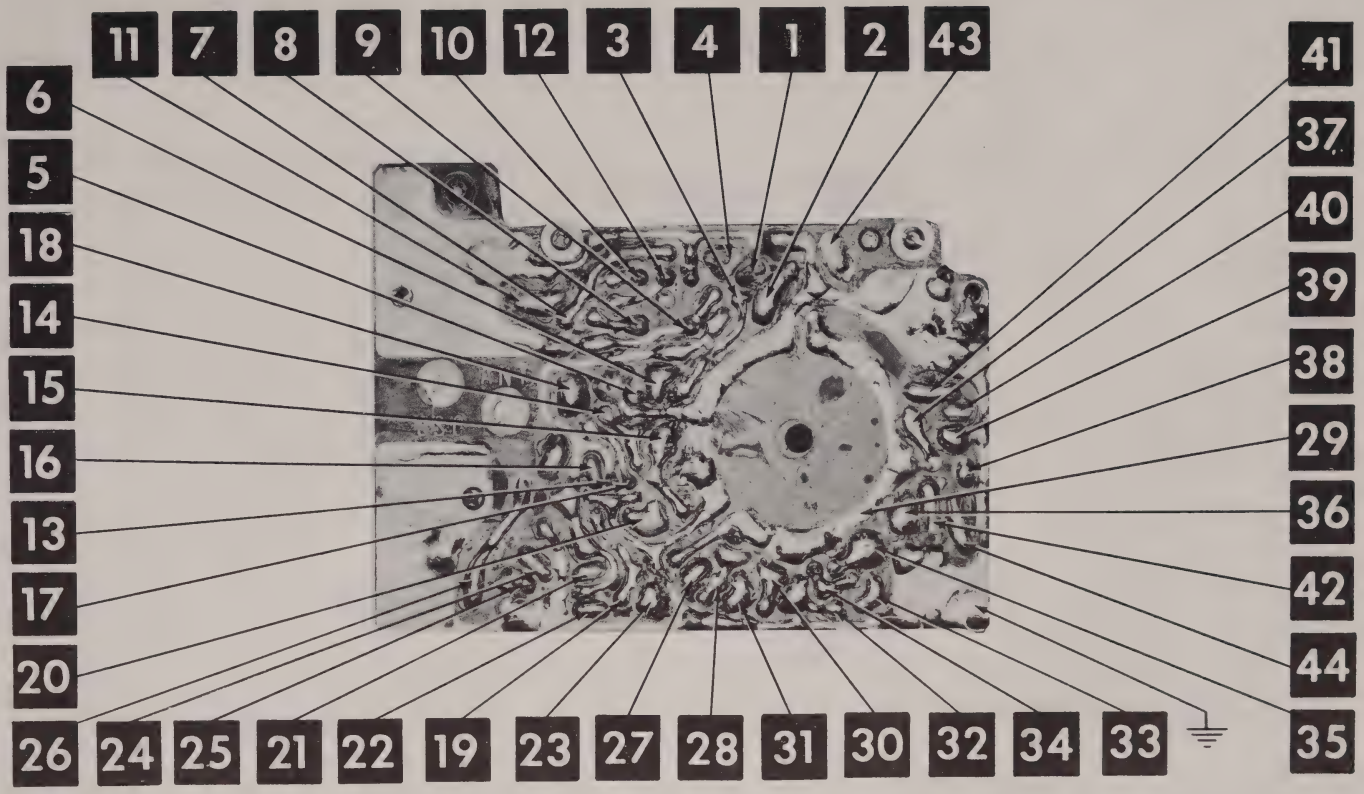
CONTINENTAL MODEL TR-801



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA31	Mixer				PNP
X2	2SA30	Oscillator				PNP
X3	2SA31	1st IF Amplifier				PNP
X4	2SA31	2nd IF Amplifier				PNP
X5	2SB32	AF Amplifier				PNP
X6	2SB32	Driver				PNP
X7	2SB33	Output				PNP
X8	2SB33	Output				PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Continental PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	3			NLW30-6	TT6X30	MLV30-6	TE-1092	
C2	5	3			NLW5-15	TT6X5	MLV5-3	TE-1052, 2	
C3	5	3			NLW5-15	TT6X5	MLV5-3	TE-1052, 2	
C4	5	6			NLW5-15	TT6X5	MLV5-6	TE-1084	
C5	5	3			NLW5-15	TT6X5	MLV5-3	TE-1052, 2	
C6	10	10			NLW10-15	TT12X10	MLV10-10	TE-1114	
C7	30	6			NLW30-6	TT6X30	MLV30-6	TE-1092	
C8	30	6			NLW30-6	TT6X30	MLV30-6	TE-1092	
C9	30	6			NLW 30-6	TT6X30	MLV30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	40000							
C11	40000							
C12	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C13	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C14	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C15	40000							
C16	7		NPO-SI 6.8	TCZ-6R8	C10V7C	CCTO-6R8	CNO-568	10TCC-V68
C17	40000							
C18	40000							
C19	40000							
C20	6				C10V6C			
C21	40000							
C22	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C23	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C24	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C25	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C26	5000		C80V502AM	DA-203	H-05D5	CCD-502	TA-250	TG-D50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	Continental PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4		B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	5000Ω				R17	5000Ω			
R3	20K				R18	600Ω			
R4	3300Ω				R19	2000Ω			
R5	200Ω				R20	20K			
R6	10K				R21	2000Ω			
R7	1000Ω				R22	600Ω			
R8	50K				R23	50Ω			
R9	10K				R24	100Ω			
R10	5000Ω				R25	100Ω			
R11	500Ω				R26	100Ω			
R12	2000Ω				R27	330Ω			
R13	50K				R28	5500Ω			
R14	600Ω				R29	Temp. Comp.			Pt. #KD-27
R15	500Ω				R30	10Ω			
R16	50K				R31	2000Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Continental PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Loopstick	LA-523				
L2	Osc.	LB-524				
L3	1st IF	ZC-187				
L4	2nd IF	ZC-135				
L5	3rd If	ZC-189				

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Continental PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4.8	1	IT-508					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Continental PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	450Ω CT	10-12Ω	OT-518					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Continental PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10-12Ω	6P-3A		

BATTERIES

ITEM No.	VOLTAGE	Continental PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			930 *		1015 *		M-15R *	* 4 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Continental PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1NA1G			1N60	1N60	Detector (Pigtail)

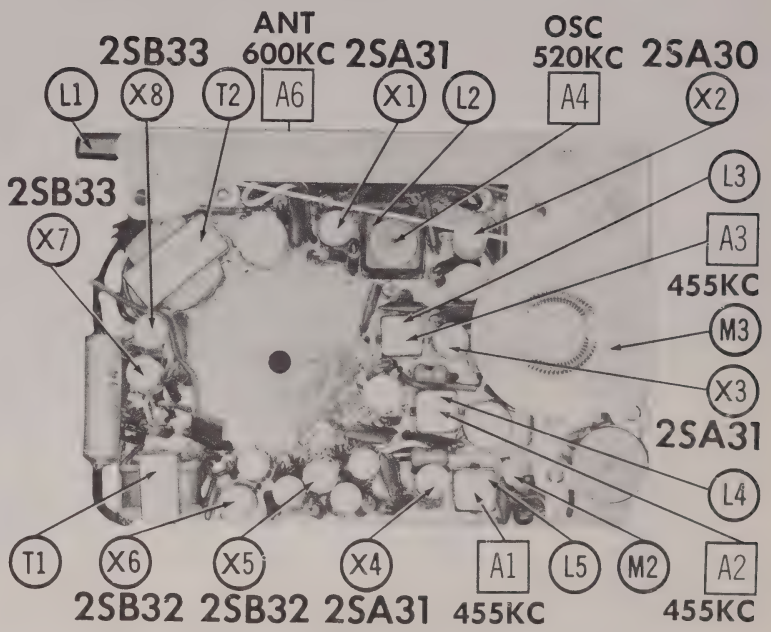
MISCELLANEOUS

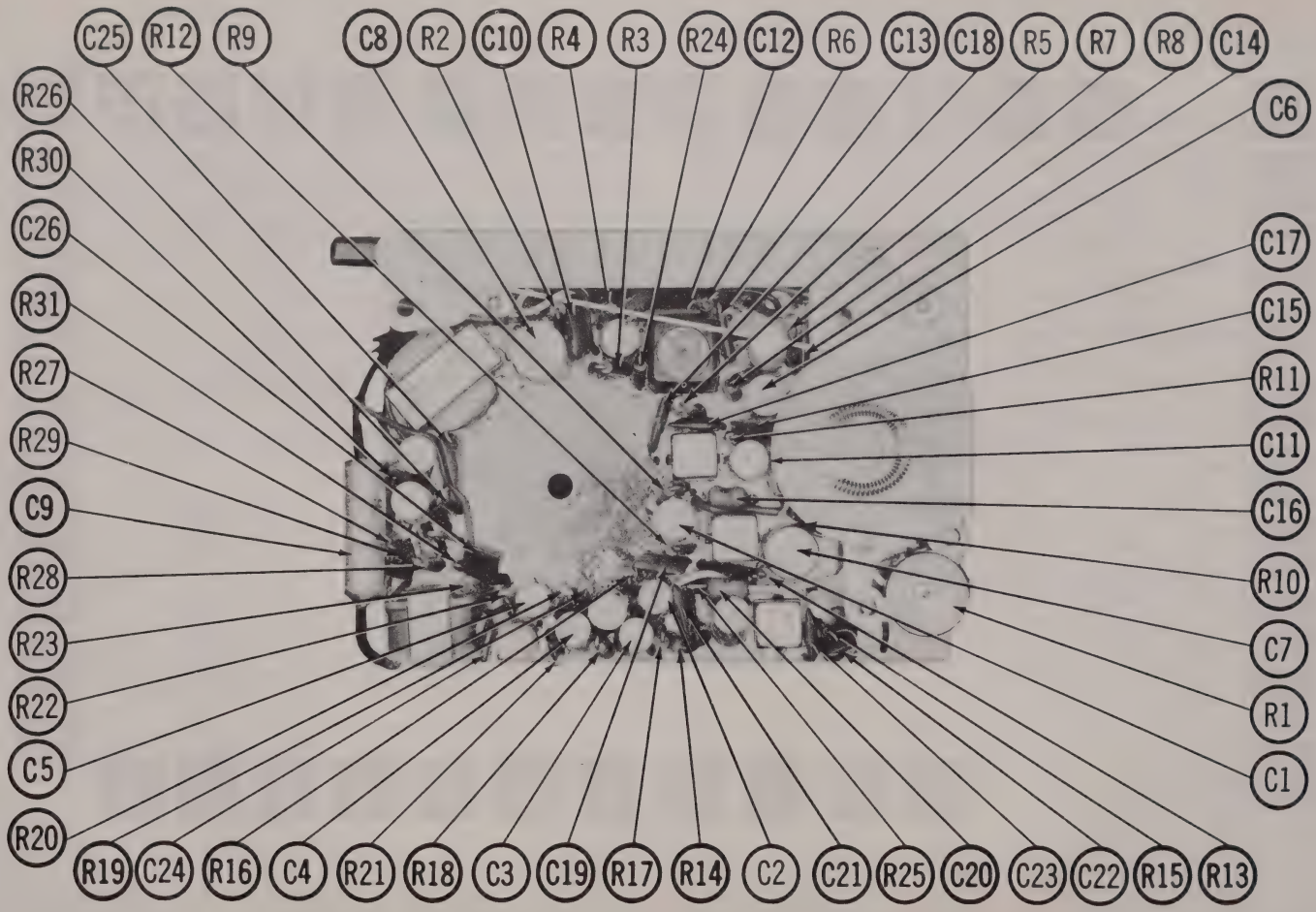
ITEM No.	PART NAME	Continental PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW





CHASSIS TOP VIEW-CAPACITOR & RESISTOR IDENT.

PHOTOFACT® Folder

EMUD MODELS
910, 911, 915, 916

EMUD MODELS
910, 911, 915, 916

MODEL 915

EMUD MODELS
910, 911, 915, 916

TRADE NAME	Emud Models 910, 911, 915, 916
IMPORTER	Delmonico International, Div. of Thompson Starrett Co., Inc., 120-20 Roosevelt Ave., Corona 68, N. Y.
TYPE SET	AC Operated 10 Tube FM-BC-SW Receiver with Stereo Amplifier and 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 110 Watts, .94 Amp. @117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	515 – 1620KC SHORT WAVE 5.9 – 10MC FREQ. MOD. 88 – 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR MONARCH UA8 – PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11

SET 524 FOLDER 10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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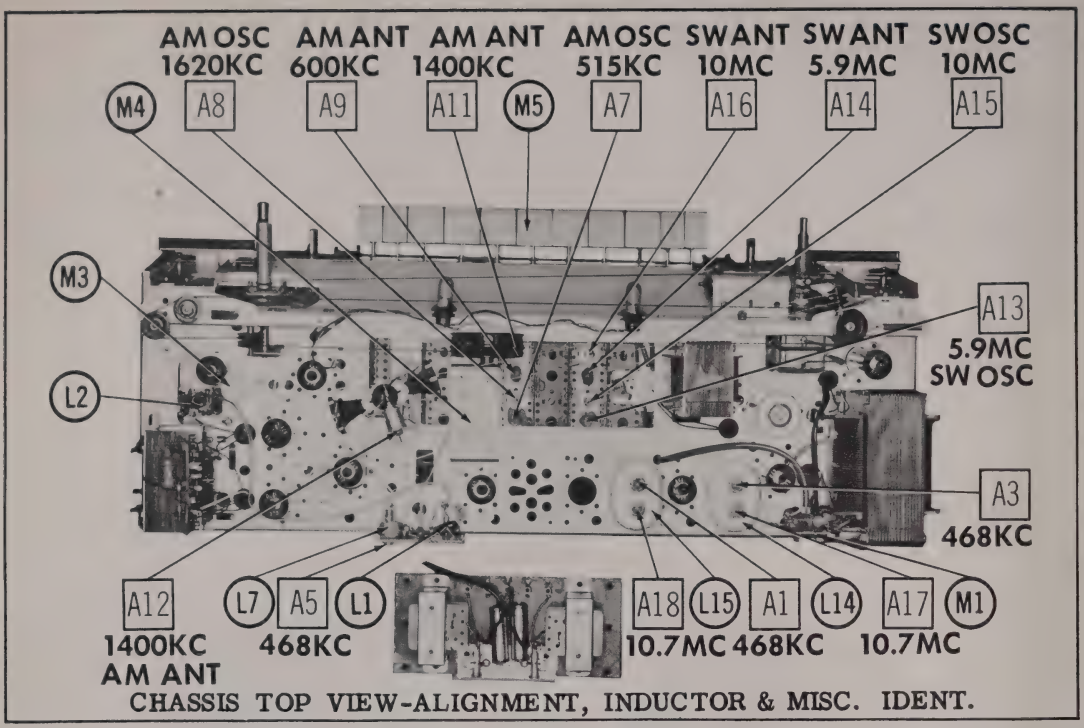
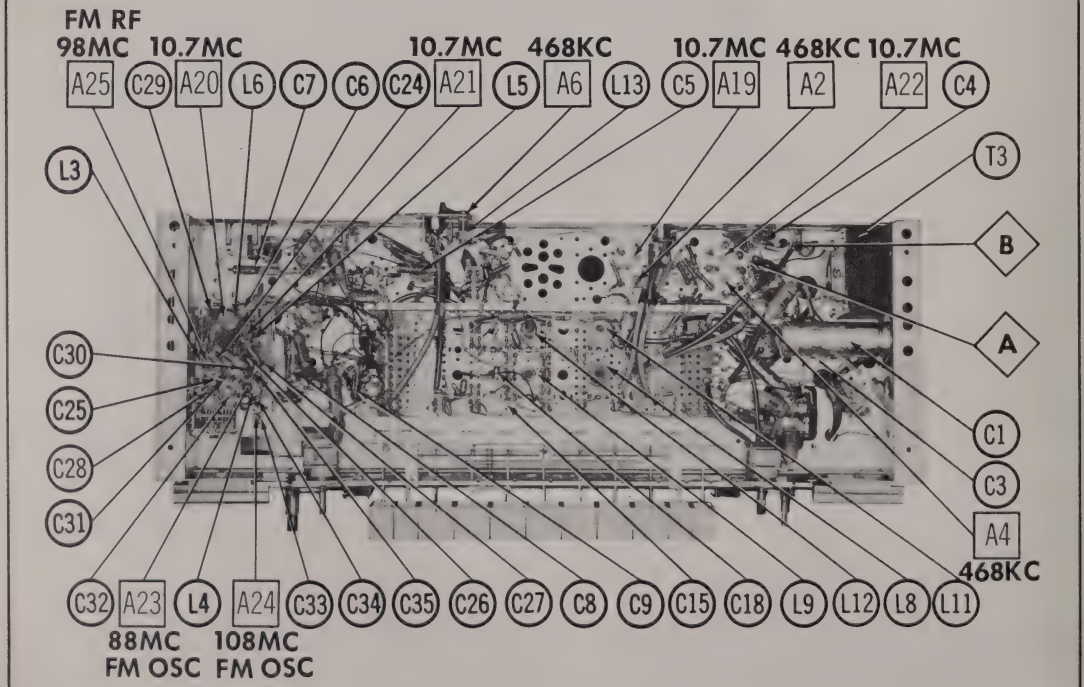
KN331



CHASSIS TOP VIEW-ALIGNMENT, INDUCTOR & MISC. IDENT.



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & INDUCTOR IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A7, A9, A13, A14. . GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

AM ALIGNMENT – SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 2 (grid) of AM Mixer. Low side to chassis.	468 KC (400∿ AM Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side to AM antenna terminal. Low side to chassis.	"	"	"	A5, A6	Adjust for MINIMUM output.
3.	"	515KC	Tuning gang fully closed.	"	A7	Adjust for maximum output.
4.	"	1620KC	Tuning gang fully open.	"	A8	"
5.	"	600KC	600KC	"	A9, A10	"
6.	"	1400KC	1400KC	"	A11, A12	"
7.	"	5.9MC	(SW) 5.9MC	"	A13, A14	"
8.	"	10MC	10MC	"	A15, A16	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A17, A18, A19, A20, A21	Adjust for maximum deflection.
10.	"	"	"	DC probe to point Ⓑ. Common to Point Ⓒ.	A22	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	Across FM antenna terminals.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp to point Ⓐ. Low side to chassis.	A17, A18, A19, A20, A21	Disconnect stabilizing Capacitor C4. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C4.
10.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A22	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A17 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT – SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	Across FM antenna terminals.	88MC (Unmod.)	(FM) 88MC	DC probe to point Ⓐ. Common to chassis.	A23	Adjust for maximum deflection.
12.	"	108MC	108MC	"	A24	"
13.	"	98MC	98MC	"	A25	"

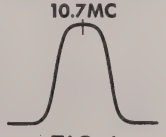


FIG. 1

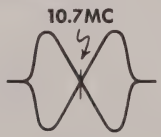
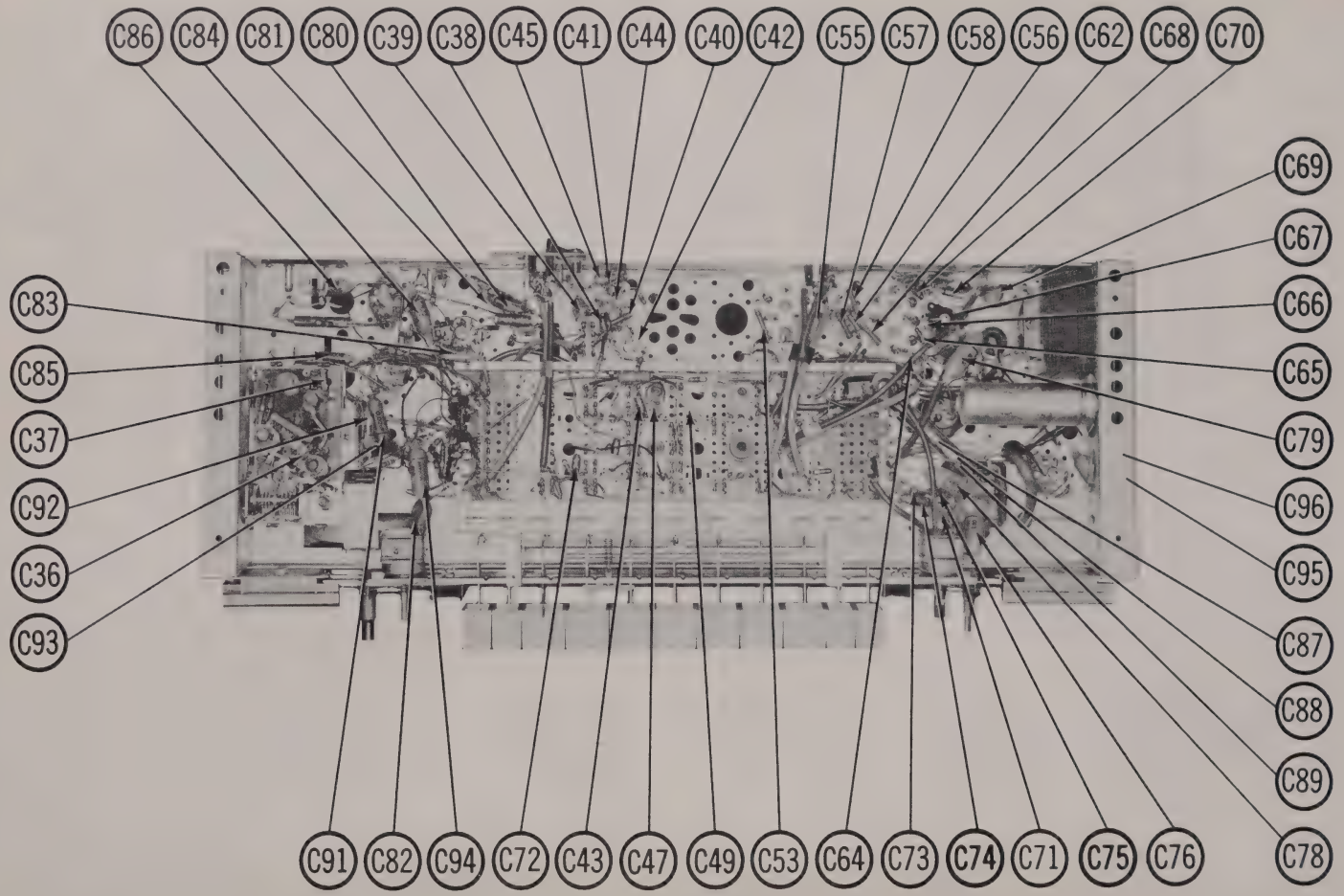
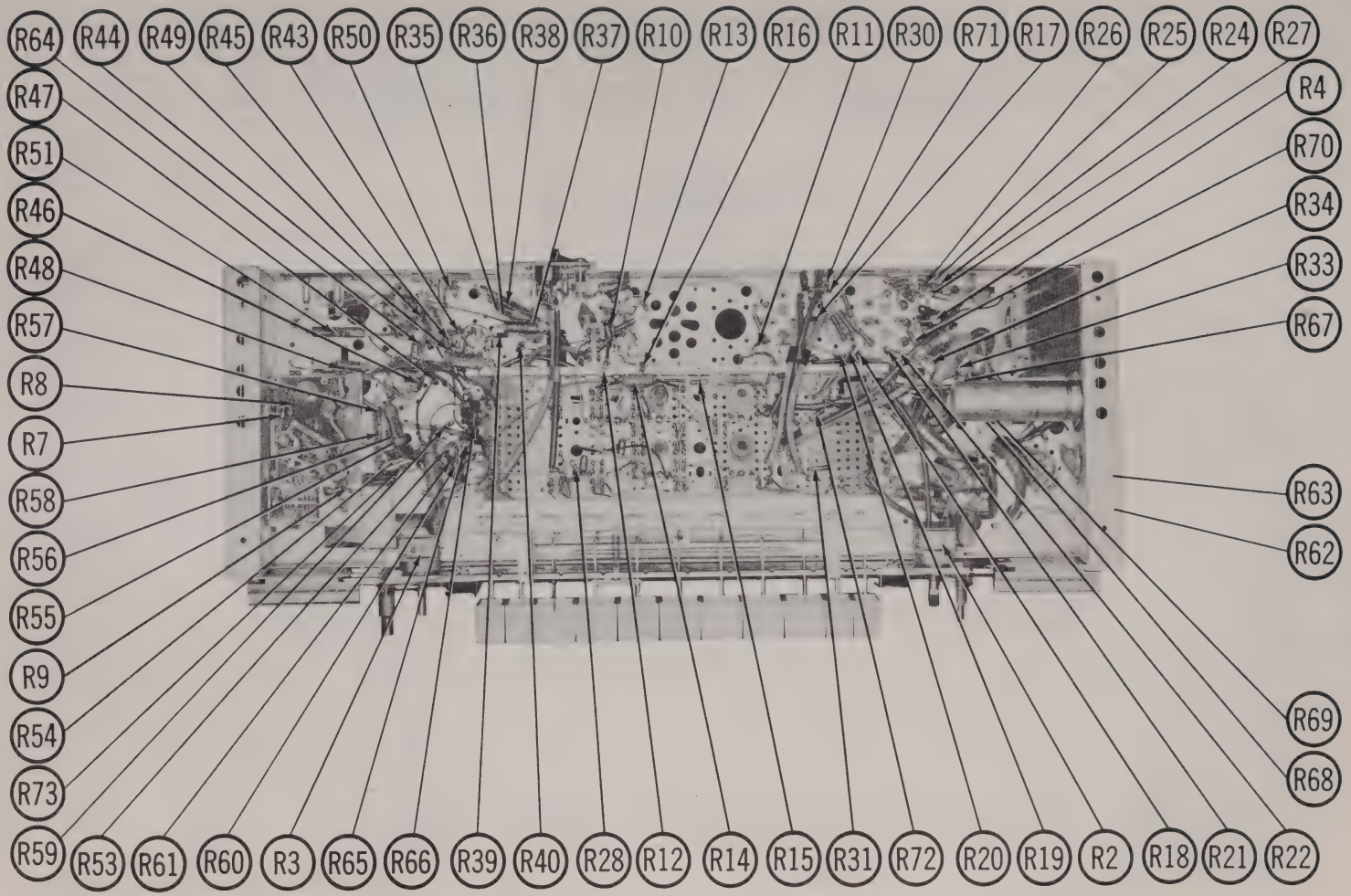


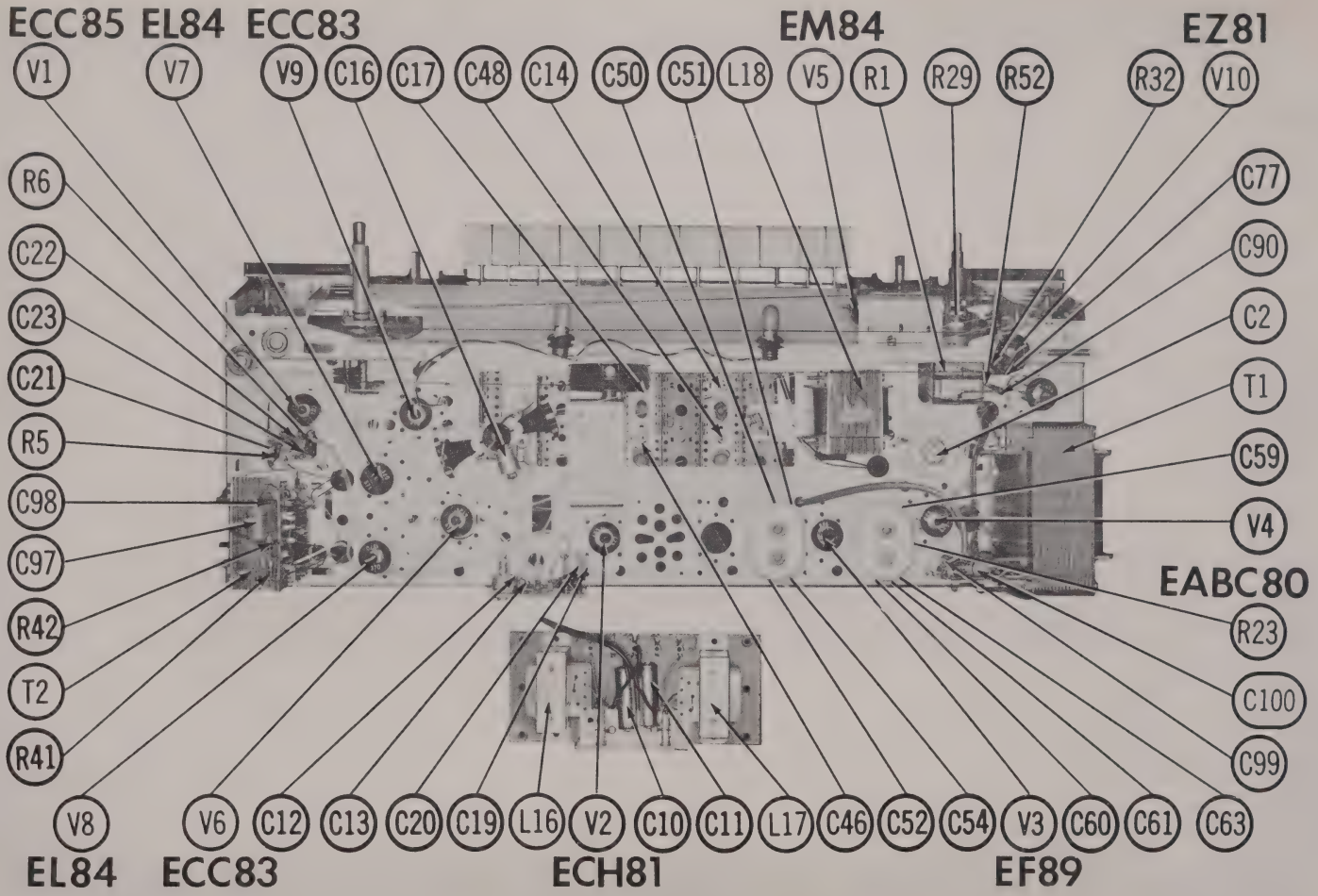
FIG. 2



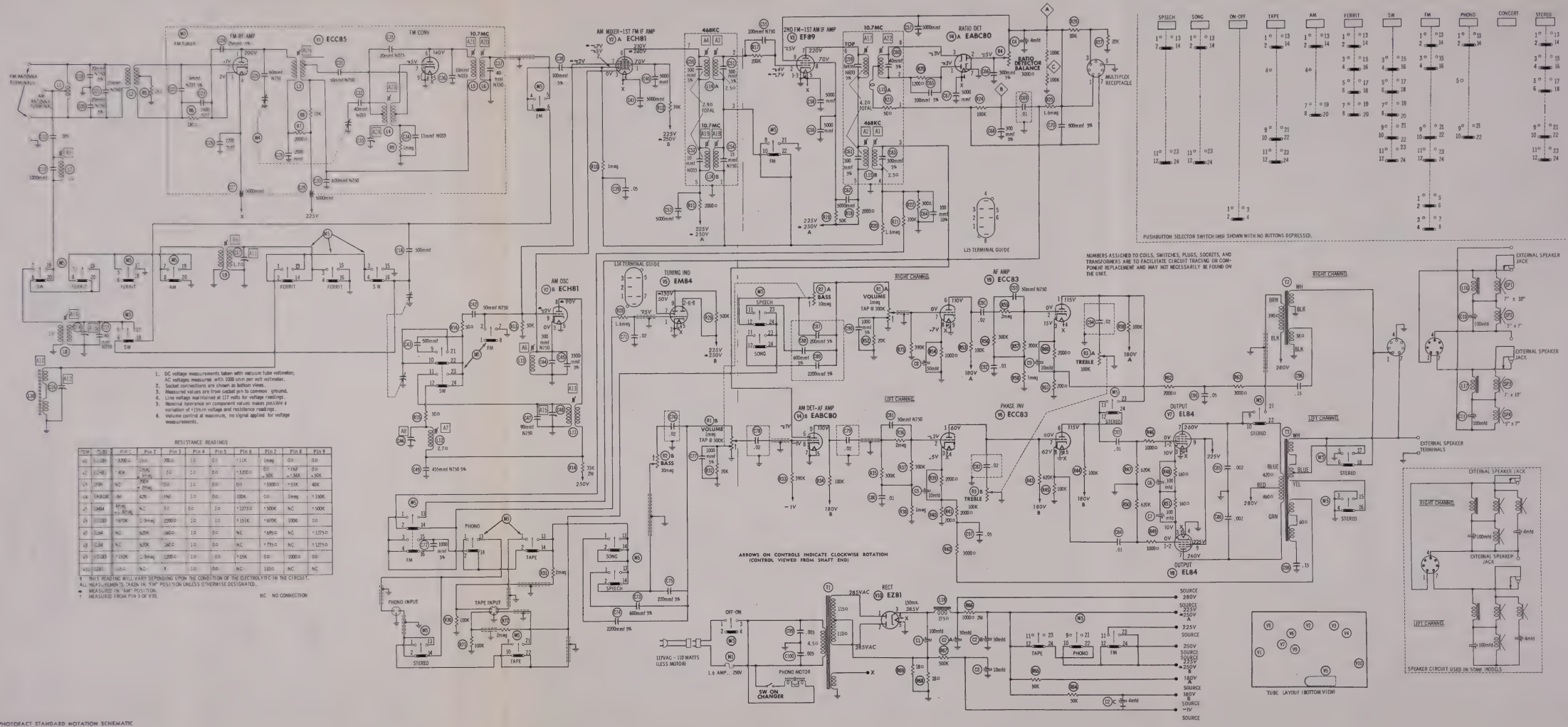
CHASSIS BOTTOM VIEW-CAPACITOR IDENT.



CHASSIS BOTTOM VIEW-RESISTOR IDENT.



CHASSIS TOP VIEW



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
Y1	ECC85	3300Ω	0Ω	300Ω	1Ω	0Ω	11K	1meg	0Ω	0Ω
Y2	EF89	40K	2meg	2K	1Ω	0Ω	3200Ω	0Ω	*1MF	0Ω
Y3	ECH81	NC	39K*	0Ω	1Ω	0Ω	0Ω	3300Ω	51K	40K
Y4	EABC80	NF	42K	1MF	1Ω	0Ω	100K	0Ω	1meg	150K
Y5	EM84	47meg	NC	0Ω	0Ω	1Ω	1275Ω	500K	NC	500K
Y6	ECC83	1970K	2.3meg	2000Ω	1Ω	1Ω	151K	670K	100K	0Ω
Y7	EL84	NC	420K	160Ω	1Ω	0Ω	NC	695Ω	NC	1275Ω
Y8	EL84	NC	420K	160Ω	1Ω	0Ω	NC	735Ω	NC	1275Ω
Y9	EZ81	152K	1.3meg	1200Ω	1Ω	1Ω	15K	0Ω	1000Ω	0Ω
Y10	EZ81	152K	NC	1Ω	1Ω	0Ω	NC	110Ω	NC	NC

* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
• MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 3 OF V10.
NC NO CONNECTION

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EMUD MODELS
910, 911, 915, 916

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amp. -FM Conv.	ECC85 (6AQ8) *	V5	Tuning Indicator	EM84
V2	1st FM IF Amp. -AM Mixer AM Osc.	ECH81 (6AJ8) *	V6	Phase Inverter	ECC83 (12AX7) *
			V7	Right Channel Output	EL84 (6BQ5) *
V3	2nd FM-1st AM IF Amp.	EF89 (6DA6) *	V8	Left Channel Output	EL84 (6BQ5) *
V4	Ratio Det. -AM Det. - Left Channel AF Amp.	EABC80 (6AK8) *	V9	Right Channel AF Amp.	ECC83 (12AX7) *
			V10	Rectifier	EZ81 (6CA4) *

GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EMUD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	100	350				TC69			
C2A	50	350							
B	50	350							
C	4	350							
C3	10	12		PTT-12010	NLW10-15	TT12X10	ML10-12	TE-1128	
C4	4	100		SRE150V5	NLW4-150	TT150X4	ML V5-100	TE-1403	
C5	10	12		PTT-12010	NLW10-15	TT12X10	ML10-12	TE-1128	
C6	100	12		SRE12V100	NLW100-12	TT15X100	ML100-12	TE-1135	
C7	100	12		SRE12V100	NLW100-12	TT15X100	ML100-12	TE-1135	
C8	50	12		PTT-12050	NLW50-15	TT15X50	ML50-12	TE-1133	
C9	10	12		PTT-12010	NLW10-15	TT12X10	ML10-12	TE-1128	
C10	100	15		SRE15V100	NLW100-15	TT15X100	ML100-15	TE-1162	
C11	100	15		SRE15V100	NLW100-15	TT15X100	ML100-15	TE-1162	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C12	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C13	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C14								
C15	90 N750		N750-SI 91	TCN-91	C10Q91U	CCTN-101	CN7-310	10TCU-T10
C16								
C17								
C18	500		SI 500	D6-501	BYA10T5	CCD-501	B-350	10TS-T50
C19	20 N750 5%			TCN-20	C10Q2U		CN7-420	10TCU-Q20
C20	20 N750 5%			TCN-20	C10Q2U		CN7-420	10TCU-Q20
C21	27 N750			TCN-27	C10Q27U	CCTN-270 *	CN7-427 *	
C22	6 N033 5%							
C23	1500		SI 1500	D6-152	BYA10D15	CCD-152	B-215	5HK-D15
C24	25 5%			DTZ-25	C10Q25C	CM-19B-240J	CNO-425	10TCC-Q25
C25	60 N750		N750-SI 62	TCN-62	C10Q62U	CCTN-620		
C26	2200		SI 2200	D6-222	BYA10D22	CCD-222	B-222	5HK-D22
C27	5000							
C28	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C29	5000							
C30	600 N750		N750-SI 620	TCN-620				
C31	50 N750		N750-SI 50	TCN-50	C10Q5U	CCTN-470 *	CN7-447	10TCU-Q47
C32	40 N033							
C33								
C34	11 N033					*		

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C35	20 N075					*		
C36	10 N033					*		
C37	40 N150					*		10TCP-Q39
C38	100 5%			TCZ-100	C10T1C	CM-19B-101J	CNO-310	10TCC-T10
C39	.05 125V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C40	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C41	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C42	50 N750		N750-SI 50	TCN-50	C10Q5U	CCTN-470	CN7-447	10TCU-Q47
C43	500		SI 500	D6-501	BYA10T5	CCD-501	B-350	10TS-T50
C44	300 N750		N750-SI 300	TCN-300	C10T3U	CCTN-301	CN7-333	10TCU-T33
C45	3300 5%				1R5D33	CM-20B-332J	MCJ462	MS-233
C46								
C47	90 N750		N750-SI 91	TCN-91	C10Q91U	CCTN-101	CN7-310	10TCU-T10
C48								
C49	455 N750 5%			TCN-470				10TCC-T47
C50	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C51	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C52	10 N033					*		
C53	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C54	15 N750		N750-SI 15	TCN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C55	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C56	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C57	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C58	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C59	6 N033 5%					*		
C60	40 5%			TCZ-43	C10Q43C	CM-19B-430J	CNO-439	10TCC-Q39
C61	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C62	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C63	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C64	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	CNO-310	10TS-T10
C65	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C66	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C67	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C68	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C69	.01 500V	Note 1						
C70	500 5%				5R5T5	CM-19B-501J	MCE245	MS-35
C71	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C72	1000 5%				5R5D1	CM-19B-102J	MCE255	MS-21
C73	600 5%				5R5T6	CM-19B-621J		MS-36
C74	2200 5%				1R5D22	CM-19B-222J	MCJ459	MS-222
C75	220 5%			TCZ-220	22R5T22	CM-19B-221J	CNO-322	10TCC-T22
C76	.02 500V	Note 1						
C77	1000 5%				5R5D1	CM-19B-102J	MCJ255	MS-21
C78	.02 500V	Note 1						
C79	.02 500V	Note 1						
C80	.01 125V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C81	50 N750		N750-SI 50	TCN-50	C10Q5U	CCTN-470	CN7-447	10TCU-Q47
C82	.02 500V	Note 1						
C83	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C84	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C85	.002 500V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C86	.002 500V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C87	200 5%			TCZ-200	22R5T2	CM-19B-201J	CNO-320	10TCC-T20
C88	600 5%				5R5T6	CM-19B-621J		MS-36
C89	2200 5%				1R5D22	CM-19B-222J	MCJ459	MS-222
C90	1000 5%				5R5D1	CM-19B-102J	MCJ255	MS-21
C91	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C92	.01 125V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C93	50 N750		N750-SI 50	TCN-50	C10Q5U	CCTN-470	CN7-447	10TCU-Q47
C94	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C95	.05 125V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C96	.15 125V		P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C97	.05 125V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C98	.15 125V		P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C99	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C100	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50

Note 1. Shielded Unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMUD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg 300K Tap	½						Volume, Left Channel
B	1meg 300K Tap	½						Volume, Right Channel
R2A	10meg	½						Bass, Left Channel
B	10meg	½						Bass, Right Channel
R3A	100K	½						Treble, Left Channel
B	100K	½						Treble, Right Channel
R4	3000Ω	½						Ratio Detector Balance

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	15Ω			
R6	180Ω			
R7	2000Ω			
R8	10K			
R9	1meg			
R10	1meg			
R11	2000Ω			
R12	39K			
R13	50K			
R14	33K 2W			
R15	50Ω			
R16	50Ω			
R17	200K			
R18	2000Ω			
R19	60K			
R20	1.6meg			
R21	100K			
R22	300K			
R23	50Ω			
R24	100K			
R25	1.6meg			
R26	20K			
R27	20K			
R28	1.6meg			
R29	500K			
R30	100K			
R31	2meg			
R32	20K			
R33	390K			
R34	100K			
R35	300K			
R36	2meg			
R37	300K			
R38	1meg			
R39	2000Ω			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R40	200Ω			
R41	2000Ω			
R42	3000Ω			
R43	620K			
R44	100K			
R45	100K			
R46	1000Ω			
R47	620K			
R48	160Ω			
R49	1000Ω			
R50	620K			
R51	160Ω			
R52	20K			
R53	100K			
R54	1000Ω			
R55	2meg			
R56	300K			
R57	300K			
R58	1meg			
R59	100K			
R60	2000Ω			
R61	200Ω			
R62	2000Ω			
R63	3000Ω			
R64	50K			
R65	50K			
R66	1000Ω 2W			
R67	500K			
R68	18Ω			
R69	18Ω			
R70	1200Ω			
R71	100K			
R72	2meg			
R73	390K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		EMUD PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Ant.					
L2	FM Ant.					
L3	FM RF					
L4	FM Osc.					
L5	1st FM IF Prim.					
L6	1st FM IF Sec.					
L7	468KC IF Trap					
L8	SW Ant.					
L9	BC Ant.					
L10	Loopstick					
L11	SW Osc.					
L12	BC Osc.					
L13	468KC IF Trap					
L14A	1st AM IF	⟩				
B	2nd FM IF					
L15A	Ratio Detector	⟩				
B	2nd AM IF					

CROSSOVER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L16		.4Ω	.0025 HY						
L17		.4Ω	.0025 HY						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L18	.130A	275Ω	1.1 HY						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .94A	570VCT @ .130A DC	6.3V @ 5.1A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.[1]	EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5500Ω	3-4Ω						
		SEC. 2						
		55Ω						
	PRI.	SEC. 1						
T3	7500Ω CT	3-4Ω						
		SEC. 2						
		52Ω						

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EMUD PART No.	QUAM PART No.	
SP1	7"x 10"	PM	3-4Ω			
SP2	5"x 7"	PM	3-4Ω			
SP3	7"x 10"	PM	3-4Ω			
SP4	5"x 7"	PM	3-4Ω			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMUD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		1.6A 250V						

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	EMUD PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			76-TS-TB						

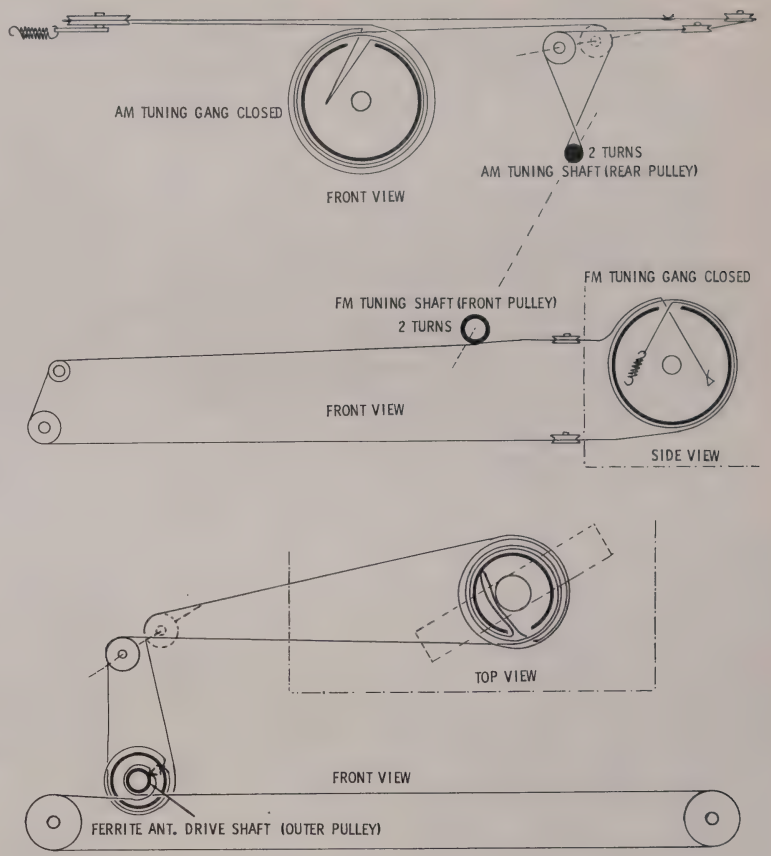
MISCELLANEOUS

ITEM No.	PART NAME	EMUD PART No.	NOTES
M3 M4 M5	Tuner Tuning Cap. Switch		FM AM 2 Gang (Pushbutton, Printed Board Type) Includes Speech, Song, Off-On, Tape, AM, Ferrit, SW, FM, Phono, Concert, & Stereo

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

DIAL CORD STRINGING



PHOTOFACT® Folder

HALLICRAFTERS MODEL CB-1

HALLICRAFTERS
MODEL CB-1

HALLICRAFTERS
MODEL CB-1

TRADE NAME	Hallicrafters Model CB-1
MANUFACTURER	The Hallicrafters Co., 4400W, 45th Street, Chicago 32, Illinois
TYPE SET	AC Operated Crystal Controlled 11 Tube Citizens Band Transmitter-Receiver
POWER SUPPLY	105 — 125 Volts AC, 60 Cycles RATING 60 Watts, .56 Amp. @117 Volts AC
TUNING RANGE	Any one of Citizens Band Channels 1 thru 22

NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED BY FCC ARE PERMITTED TO EFFECT REPAIRS OR MAKE CRYSTAL SUBSTITUTIONS ON THIS TYPE EQUIPMENT.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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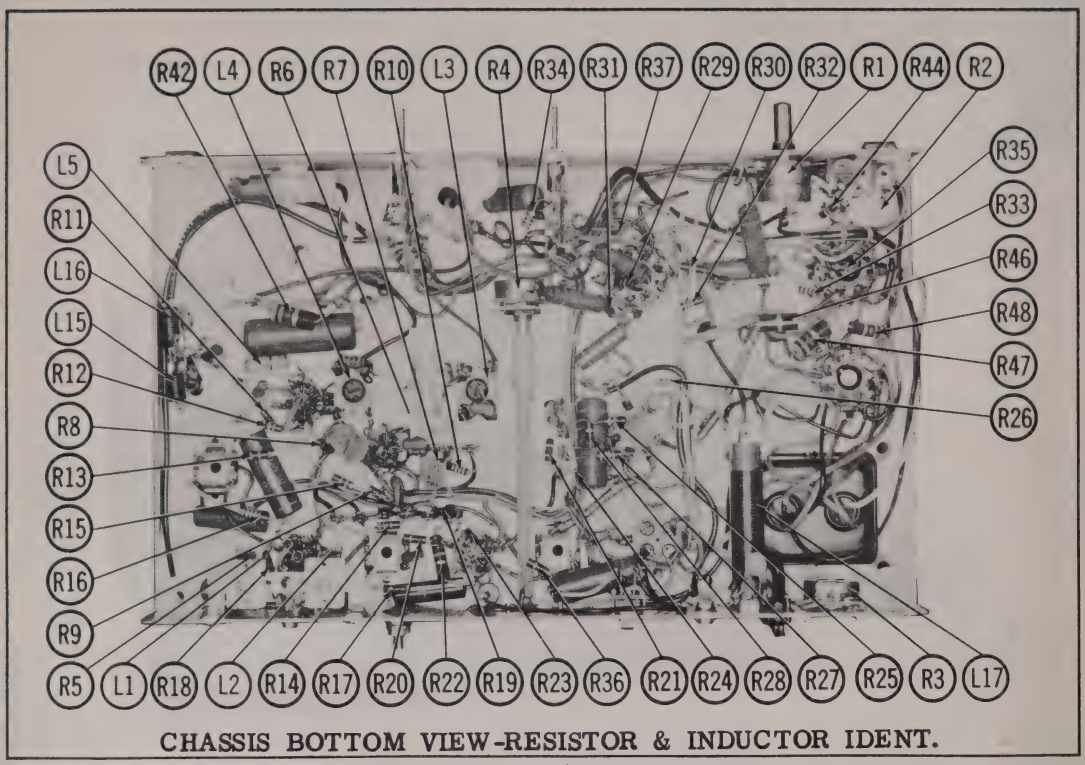
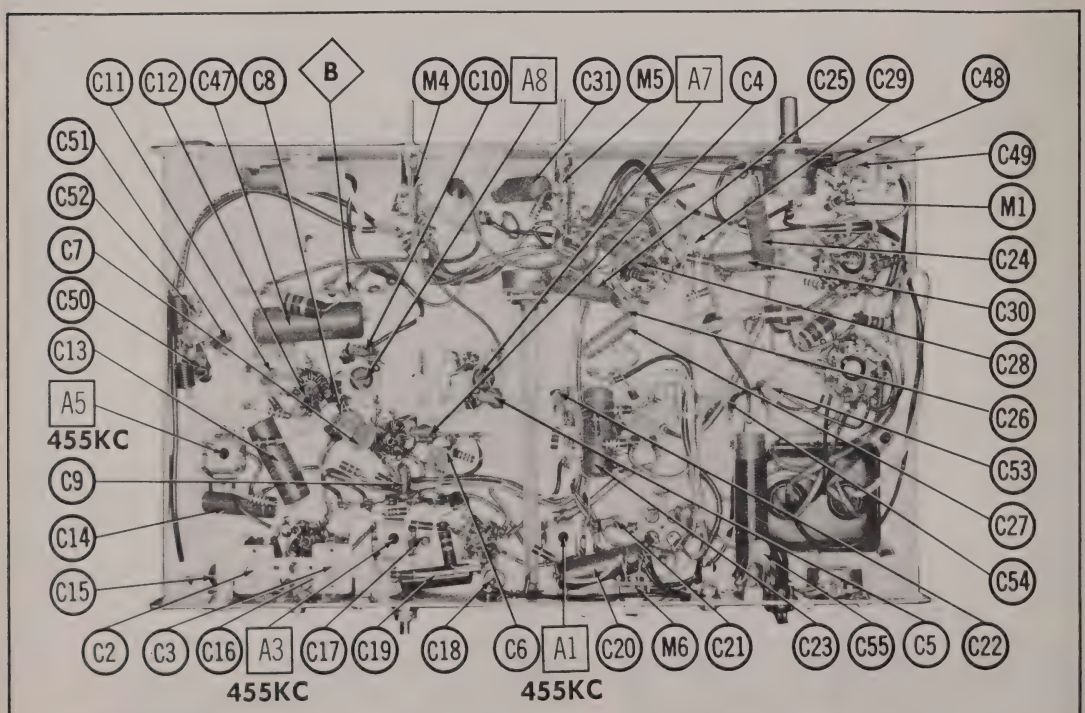
KZ384

DATE 3—61 SET 524 FOLDER 11

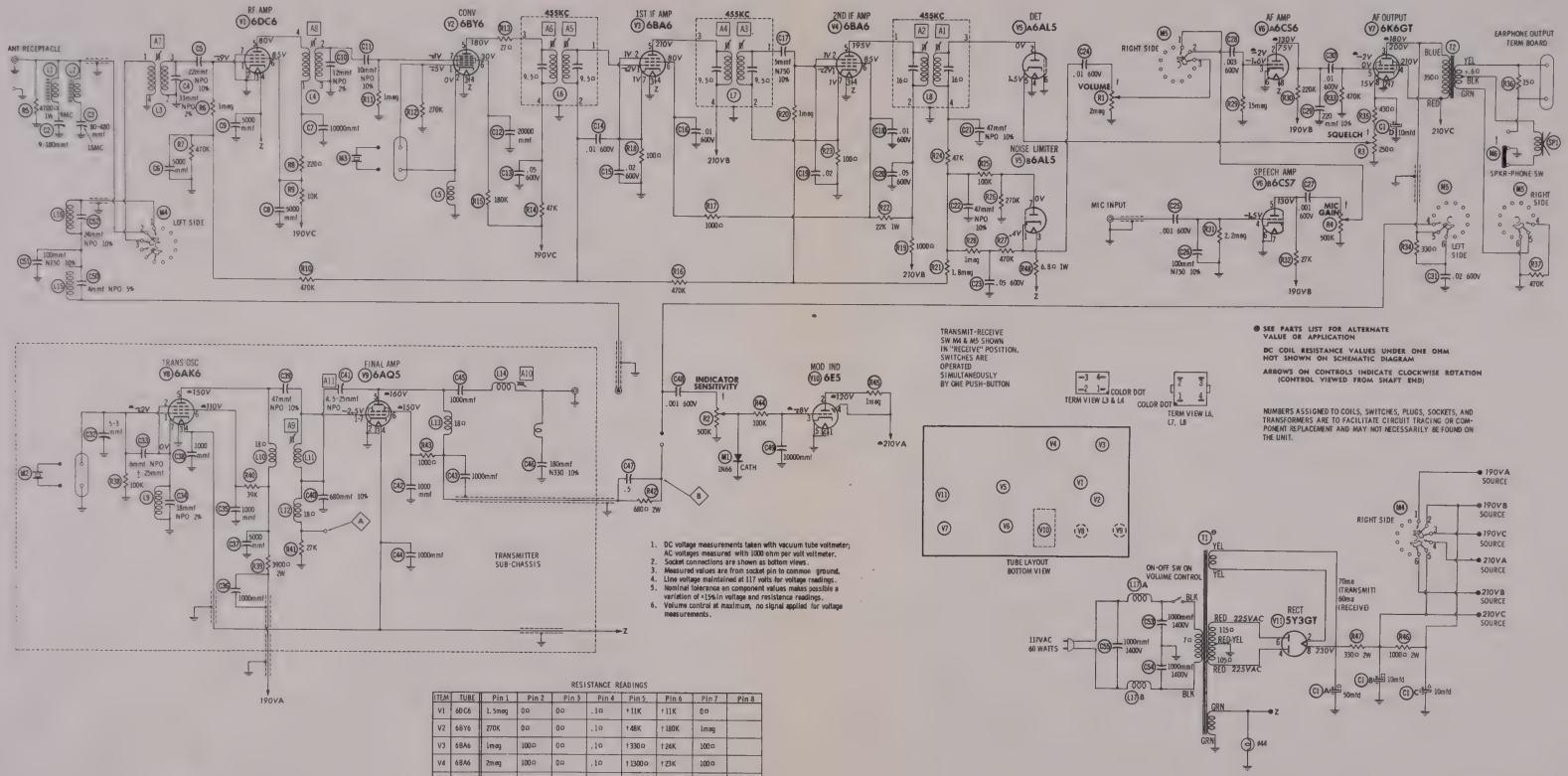
SET 524 FOLDER 11



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6DC6	1.5meg	0Ω	0Ω	.1Ω	†11K	†11K	0Ω	
V2	6BY6	270K	0Ω	0Ω	.1Ω	†48K	†180K	1meg	
V3	6BA6	1meg	100Ω	0Ω	.1Ω	†330Ω	†26K	100Ω	
V4	6BA6	2meg	100Ω	0Ω	.1Ω	†1300Ω	†23K	100Ω	
V5	6AL5	800K	420K	.8Ω	0Ω	●75Ω	0Ω	270K	
V6	6CS7	TP	†200K	15meg	2.2meg	†28K	0Ω	0Ω	.1Ω
V7	6K6GT	TP	0Ω	†680Ω	†330Ω	470K	TP	.1Ω	980Ω
V8	6AK6	100K	0Ω	0Ω	.1Ω	▬†5200Ω	▬†44K	0Ω	
V9	6AQ5A	27K	0Ω	0Ω	.1Ω	▬†1375Ω	▬†Z350Ω	27K	
V10	6E5	.1Ω	▬†1meg	100K	▬†330Ω	0Ω	0Ω		
V11	5Y3GT	TP	¶	TP	105Ω	TP	115Ω	TP	¶

ALL MEASUREMENTS MADE IN "RECEIVE" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▬ MEASURED IN "TRANSMIT" POSITION.
† MEASURED FROM PIN 8 OF V11.

NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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HALLICRAFTERS
MODEL CB-1

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amplifier	6DC6
V2	Converter	6BY6
V3	1st IF Amplifier	6BA6
V4	2nd IF Amplifier	6BA6
V5	Det. -Noise Limiter	6AL5
V6	AF Amp. -Speech Amp.	6SC7
V7	AF Output-Modulator	6K6GT
V8	Trans. Oscillator	6AK6
V9	Final Amplifier	6AQ5A
V10	Mod. Indicator	6E5
V11	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

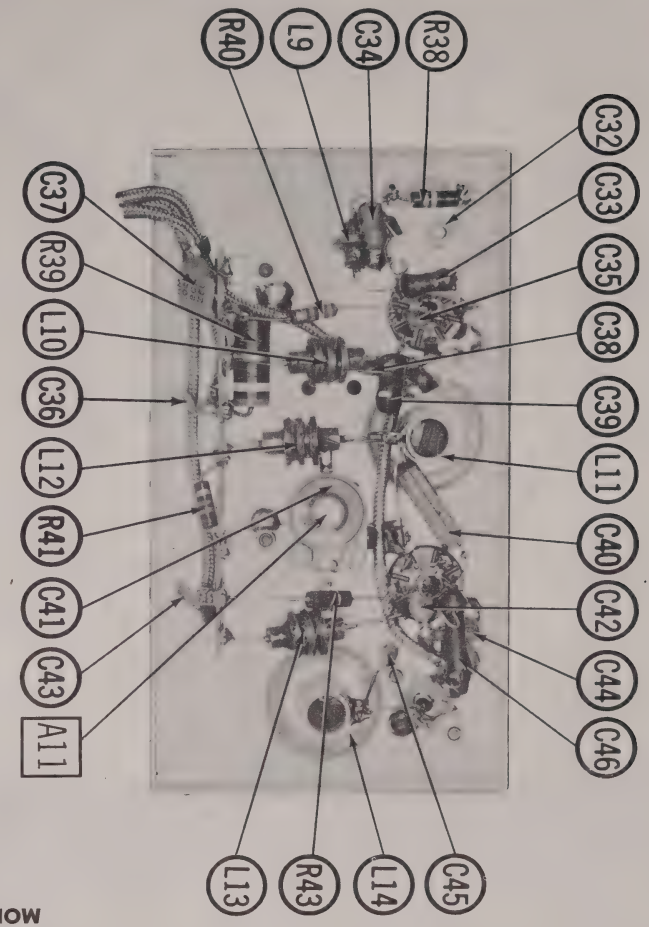
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Hallicrafters PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲50	350	045-20012 2	AFH4-17	D0160	FP475.5	TMQ-4634	TVL-4771.3	
B	■10	350							
C	▲10	350							
D	10	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	9-180	#044-300517				463		
C3	80-480					466		
C4	33 NPO 2%			TCZ-33		CM-20C-330G		
C5	22 NPO 10%		NPO-SI 22	TCZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C9	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	12 NPO 2%	#491-104120-22		TCZ-12				
C11	10 NPO 10%		NPO-SI 10	DTZ-10	C10Q1C	CCTO-100K	CNO-410	10TCC-Q10
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C13	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50
C14	.01 600V		P688N-01	D6-103	CUB6S1	6DP-1-103	GEM-611	6TM-S10
C15	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C16	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C17	5 N750 10%		N750-SI 5	TCN-5	C10V5U	CCTN-050	CN7-550	10TCU-V50
C18	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C19	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S20
C20	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50
C21	47 NPO 10%		NPO-SI 47	TCZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C22	47 NPO 10%		NPO-SI 47	TCZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C23	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50
C24	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C25	.001 600V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C26	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C27	.001 600V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C28	.003 600V		P688N-003	D6-302	CUB6D3	6DP-1-302	GEM-623	6TM-D30
C29	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C30	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C31	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C32	.5-3			829-3		CV-1	CT565	

TRANSMITTER SUB CHASSIS



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C33	6 NPO ± .25mmf	#491-101060-23			C10V6C			
C34	18 NPO 2%	#491-104180-22		TCZ-18				
C35	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C36	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C37	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C38	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C39	47 NPO 10%		NPO-SI 47	TCZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C40	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C41	4.5-25 NPO	#044-100516		822-AZ				
C42	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C43	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C44	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C45	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C46	180 N330 10%	#491-156181-73				*		
C47	.5 200V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P50
C48	.001 600V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C49	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	4 NPO 5%				C10V4C			10TCC-V39
C51	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C52	24 NPO 10%		NPO-SI 24	TCZ-24	C10Q24C		CNO-425	10TCC-Q25
C53	1000 1400V		DAC-2	DD30-102	HVBi6D1	3CCD-102	UAC-210	BL-D10
C54	1000 1400V		DAC-2	DD30-102	HVBi6D1	3CCD-102	UAC-210	BL-D10
C55	1000 1400V		DAC-2	DD30-102	HVBi6D1	3CCD-102	UAC-210	BL-D10

Hallicrafters Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Hallicrafters PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	025-201742	B-76	A47-2meg-Z	Q13-139	U55	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On
R2A	500K	1/2	025-201719	B-59	A47-500K-S	Q11-133	U50	Indicator Sensitivity
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R3A	250Ω	1/2	025-101752	TT-2		Bil-201		Squelch
B	Shaft			Not Req.		TM4		
R4A	500K	1/2	025-201728	B-59	A47-500K-S	Q11-133	U50	Mic. Gain
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	4700Ω 1W				R27	470K			
R6	1meg				R28	1meg			
R7	470K				R29	15meg			
R8	220Ω				R30	220K			
R9	10K				R31	2.2meg			
R10	470K				R32	27K			
R11	1meg				R33	470K			
R12	270K				R34	330Ω			
R13	27Ω				R35	430Ω			
R14	47K				R36	15Ω			
R15	180K				R37	470K			
R16	470K				R38	100K			
R17	1000Ω				R39	3900Ω 2W			
R18	100Ω				R40	39K			
R19	1000Ω				R41	27K			
R20	1meg				R42	680Ω 2W			
R21	1.8meg				R43	1000Ω			
R22	22K 1W				R44	100K			
R23	100Ω				R45	1meg			
R24	47K				R46	10000Ω 2W			
R25	100K				R47	330Ω 2W			
R26	270K				R48	6.8Ω 1W			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Hallicrafters PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	RF Choke(1.8uh)	053-200546	BC-562	4604	RTC-8516	① IRC Part #CLA
L2	RF Choke(1.8uh)	053-200546	BC-562	4604	RTC-8516	
L3	Ant. Trans.	051-202568	TV-116	6250	RTC-8568	
L4	RF Trans.	051-202567	TV-116	6250	RTC-8568	
L5	Cathode (.82uh)	053-100552 ①	TV-189	4594	RTC-8610	
L6	1st IF	050-300241	BC-352	12-C1	RTC-8632	
L7	2nd IF	050-300241	BC-353	12-C2	RTC-8633	
L8	3rd IF	050-300242	BC-353	12-C2	RTC-8633	
L9	Cathode (100uh)	053-200538	TV-198	6112	RTC-8574	
L10	RF Choke(515uh)	053-200537	TV-188	6174	RTC-8592	
L11	Transmitting Osc.	051-202570				
L12	RF Choke(515uh)	053-200537	TV-188	6174	RTC-8592	
L13	RF Choke(515uh)	053-200537	TV-188	6174	RTC-8592	
L14	Output	051-202571				
L15	RF Choke(1uh)	051-202598	BC-561	4602	RTC-8515	
L16	RF Choke(1uh)	051-202598	BC-561	4602	RTC-8515	
L17A	Line Choke(4uh)	053-200540	BC-564	4608	RTC-8518	
B	Line Choke(4uh)		BC-564	4608	RTC-8518	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	Hallicrafters PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ .56A	450VCT @ .070A DC	5V@ 2A	052-300680-A①					① Alternate Part # 052-300680
	SEC. 3	SEC. 4	SEC. 5						
	6.3V@ 3.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Hallicrafters PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2500Ω	100Ω Tap@ 3-4Ω	055-200406					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Hallicrafters PART No.	QUAM PART No.	
SP1	4"x 6"	PM	3-4Ω	085-400203	46A07	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Hallicrafters PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M1	1N66	019-102311		1N66	1N66	Mod. Indicator Rect. (Pigtail)

MISCELLANEOUS

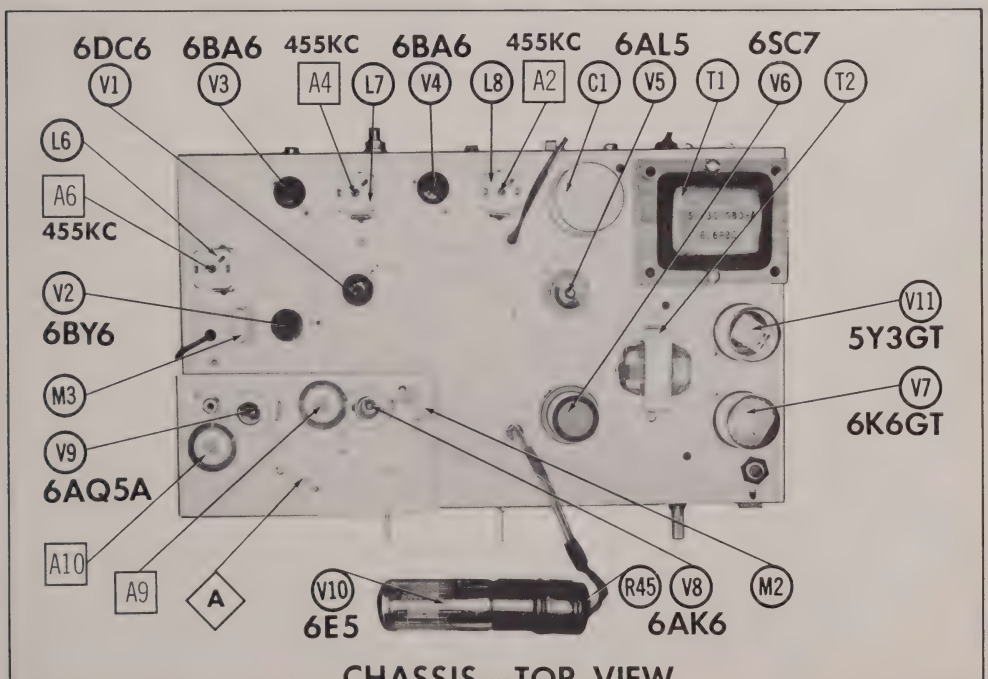
ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M2	Crystal	019-302309-	Trans. Osc. (Add Channel Number following hyphen in part Number)
M3	Crystal	019-302308-	Receiver Osc. (Add Channel Number following hyphen in part Number)
M4	Switch	060-202079	Push To Talk (Spring Return, Wafer Type)
M5	Switch	060-202079	Push To Talk (Spring Return, Wafer Type)
M6	Switch	060-200477	Speaker-Phone (SPDT Slide Type)
	Microphone	081-100101	

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Set Squelch, Microphone Gain and Indicator sensitivity controls fully counterclockwise.
Use Signal Generator with accuracy within .005%.
Suggested Alignment Tools: A1 Thru A6... GENERAL CEMENT #5097, 8727
WALSCO #2515
A7, A8..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A9, A10, A11... GENERAL CEMENT #8721, 8722
WALSCO #2519

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400∿ Mod.)	Across voice coil.	A1, A2, A3, A4, A5, A6	Adjust for maximum output.
2.	High side thru 50Ω to antenna jack. Low side to chassis.	Crystal frequency plus 455KC	"	A7, A8	"
3.			USE VTVM DC probe to point Ⓐ. Common to chassis. Connect Wattmeter across antenna jack.	A9, A10	Press "Talk" bar. Adjust A9 for maximum deflection on VTVM. Adjust A10 for maximum output on Wattmeter.
4.			"	A11	Press "Talk" bar. Remove jumper at point Ⓑ. Connect vertical amp. of scope across Wattmeter. Adjust A11 for MINIMUM deflection on scope. Reconnect plug at point Ⓑ.
5.	High side of Audio Signal generator thru 100K to the Microphone input jack. Low side to chassis.	500∿ at .03 volts output.	USE SCOPE Vert. amp. to antenna jack. Low side to chassis.	R4	Adjust for 85% modulation as seen on scope.
6.	"	"	"	R2	Adjust for complete closure of indicator eye at 85% modulation with no foldover or bright area.
7.	Connect a 9MC signal into antenna and adjust C2 for minimum output.				
8.	Connect an 18MC signal into antenna and adjust C3 for minimum output.				

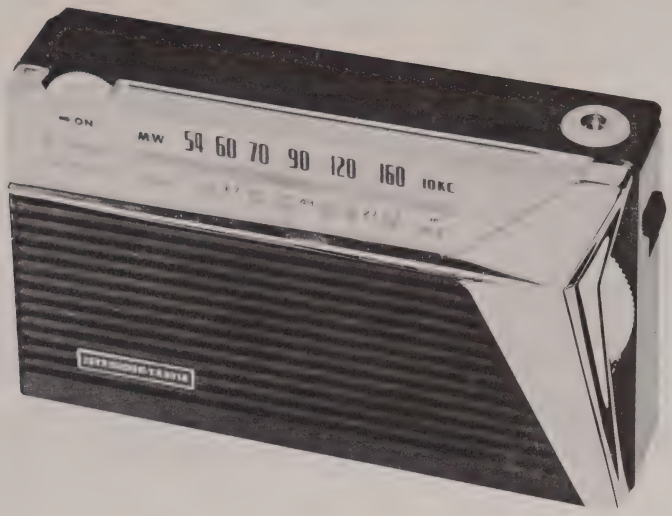


CHASSIS—TOP VIEW

PHOTOFACT® Folder with CIRCUITRACE®

JEFFERSON-TRAVIS MODEL JT-G104

JEFFERSON-TRAVIS
MODEL JT-G104



TRADE NAME	Jefferson-Travis Model JT-G104		
SUPPLIER	Jefferson-Travis, Inc., Subsidiary of Emerson Radio & Phonograph Corp., 524 W. 23rd St. New York 11, N. Y.		
TYPE SET	Battery Operated Transistorized Portable BC-SW Receiver		
POWER SUPPLY	6 Volts DC	RATING	9MA@6 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC		15MA@6 Volts DC (Signal, Normal Volume)
SHORT WAVE	3.9 — 12MC		

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4..... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537
A5, A7, A9, A11.. GENERAL CEMENT #5000, 5003, 5066, 8271, 8272, 8276, 8277, 8290, 8609, 8722, 9150, 9298
WALSCO #2515, 2516, 2518, 2519, 2525, 2541
A8..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544

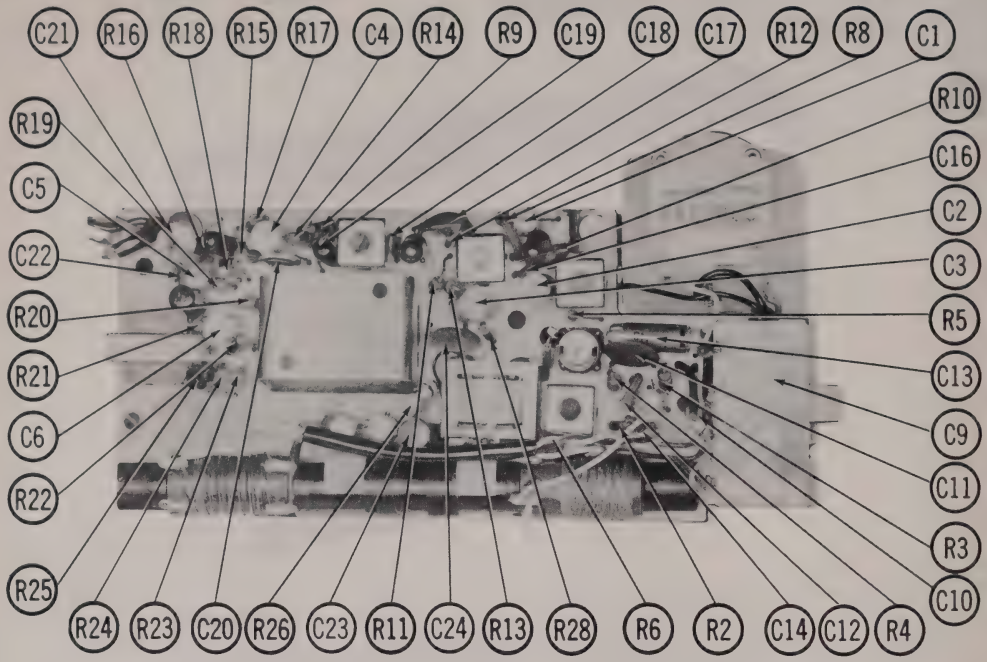
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400% Mod.)	(MW) Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	High side thru 500K to external antenna. Low side to chassis.	530KC	Tuning gang fully closed.	"	A4	"
3.	"	1650KC	Tuning gang fully open.	"	A5	"
4.	"	630KC	630KC	"	A6	"
5.	"	1400KC	1400KC	"	A7	"
6.	"	3.85MC	(SW) 3.85MC	"	A8	"
7.	"	12.5MC	12.5MC	"	A9	"
8.	"	4MC	4MC	"	A10	"
9.	"	9MC	9MC	"	A11	Adjust for maximum output. Repeat Repeat Steps 2 thru 9.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

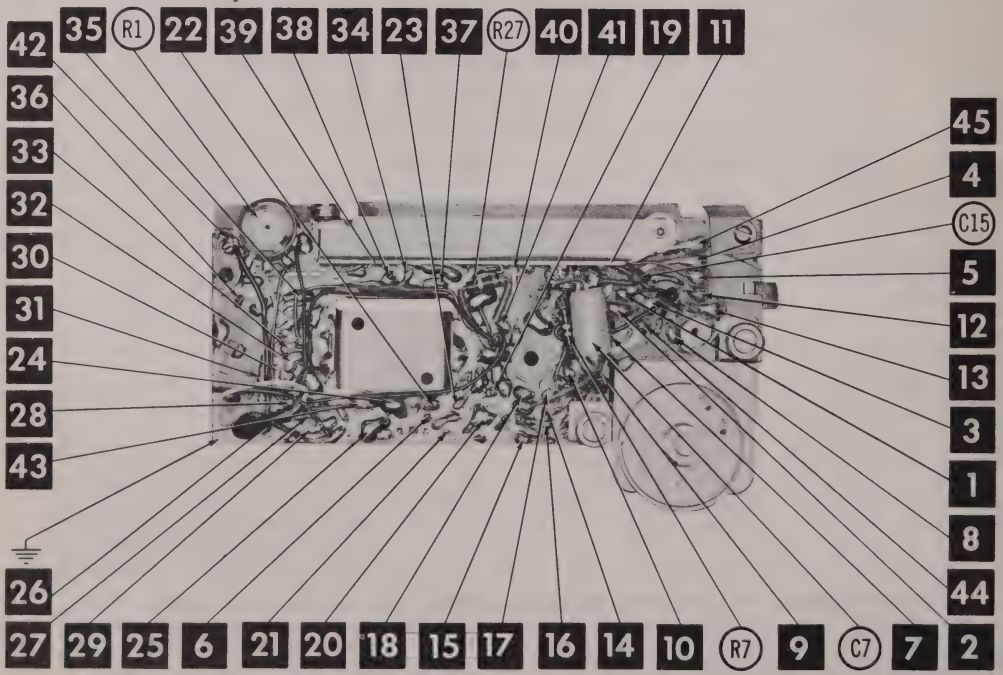
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF281

SET 524 FOLDER 12

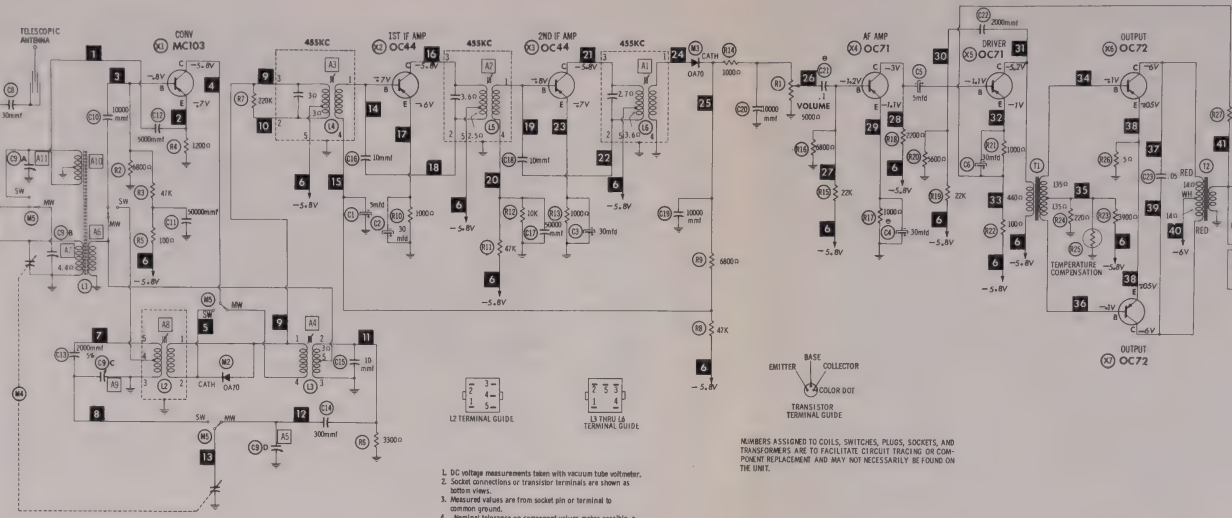


CHASSIS TOP VIEW-CAPACITOR & RESISTOR IDENT.



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD



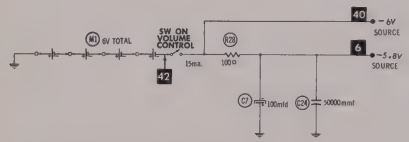
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

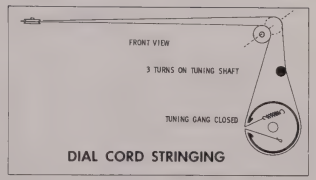
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.





A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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JEFFERSON-TRAVIS
MODEL JT-G104

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	MC103	Converter		2N486		PNP
X2	OC44	1st IF Amplifier		2N483	2N412	PNP
X3	OC44	2nd IF Amplifier		2N483	2N412	PNP
X4	OC71	AF Amplifier	2N406	2N362	2N406	PNP
X5	OC71	Driver	2N406	2N362	2N406	PNP
X6	OC72	Output	2N408	2N632	2N408	PNP
X7	OC72	Output	2N408	2N632	2N408	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Jefferson-Travis PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	5	6	CD-220	PTT-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C2	30	3	CD-232B	BCD3025	ECPB12	PET130	MLV30-6	TE-1092	
C3	30	3	CD-232B	BCD3025	ECPB12	PET130	MLV30-6	TE-1092	
C4	30	3	CD-232B	BCD3025	ECPB12	PET130	MLV30-6	TE-1092	Note 1
C5	5	6	CD-220	PTT-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C6	30	3	CD-232B	BCD3025	ECPB12	PET130	MLV30-6	TE-1092	
C7	100	6	CD-225	PTT-6100	NLW100-6	TT6X100	ML100-6	TE-1102	

Note 1. Some versions may use 5mfd in this application (Part #CD-220).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	30	#CD-137	DI-30	DD-300	L10Q3	CCD-300	GP430	10TS-Q30
C9A, B, C, D		#CD-137						
C10	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S50
C11	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50
C12	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C13	2000 5%				1R5D2	CM-19B-202J	MCE457	MS-22
C14	300			DD-301	L10T3	CCD-301	GP330	10TS-T30
C15	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C16	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C17	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50
C18	10		DI-10	DD-100	L10Q10	CCD-100	GP410	10TS-Q10
C19	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C20	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C21	.1 150V	Note 1						2WF-P10
C22	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C23	.05 200V	#C-337						2WF-S47
C24	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50

Note 1. Some versions may use .05mfd in this application (Part #C-600).
Jefferson-Travis Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Jefferson-Travis PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10	RD-134K	B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R2	6800Ω			
R3	47K			
R4	1200Ω			
R5	100Ω			
R6	3300Ω			
R7	220K			
R8	47K			
R9	6800Ω			
R10	1000Ω			
R11	47K			
R12	10K			
R13	1000Ω			
R14	1000Ω			
R15	22K			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R16	6800Ω			
R17	1000Ω			
R18	2200Ω			
R19	22K			
R20	5600Ω			
R21	1000Ω			
R22	100Ω			
R23	3900Ω			
R24	220Ω			
R25	Temp. Comp.			Pt. #S-250
R26	5.0Ω			
R27	3300Ω			
R28	100Ω			

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Jefferson-Travis PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1A	SW Loopstick	LT-162K				
B	BC Loopstick					
L2	SW Osc.	LT-227				
L3	BC Osc.	LT-224				
L4	1st IF	LT-324				
L5	2nd IF	LT-321				
L6	3rd IF	LT-322				

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA Jefferson-Travis PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2	1	LT-511		TA-36			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Jefferson-Travis PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	400Ω CT	6-8Ω	LT-438B		TA-21			

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Jefferson-Travis PART No.	QUAM PART No.	NOTES
SP1	2½"	PM	6-8Ω	SP6.5-03		

BATTERIES

ITEM No.	VOLTAGE	Jefferson-Travis PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V	*		930 *		1015 *		M-15R*	* 4 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Jefferson-Travis PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	OA70	OA70		1N60	1N60	SW Osc. Comp. (Pigtail)
M3	OA70	OA70		1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

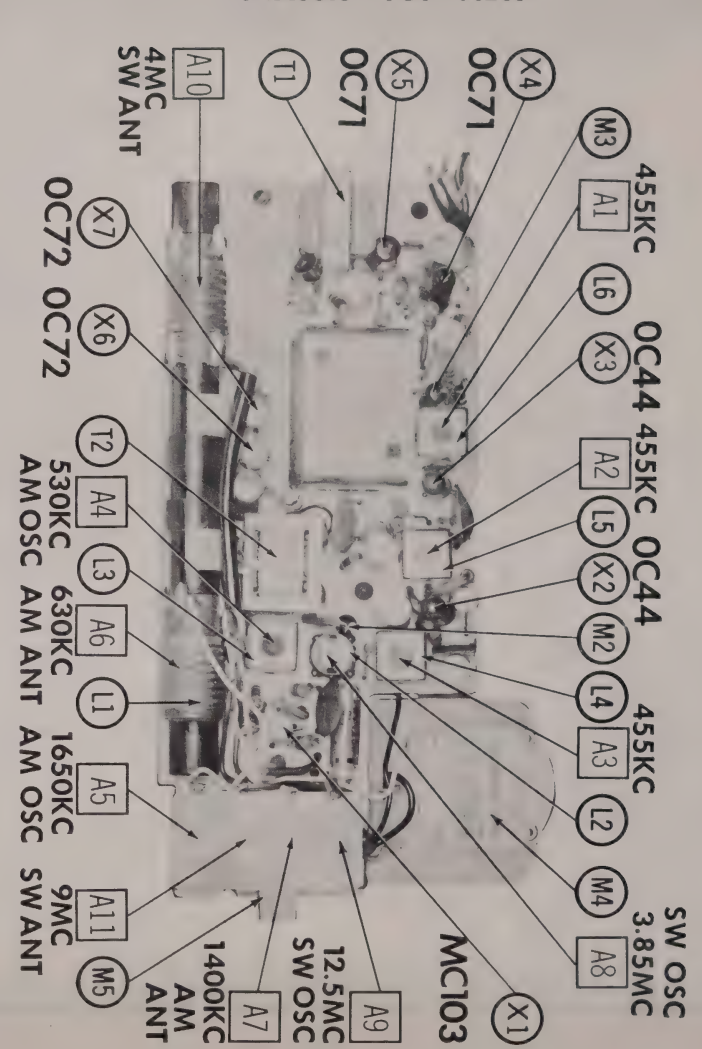
ITEM No.	PART NAME	Jefferson-Travis PART No.	NOTES
M4	Tuning Cap.	CD-141	2 Gang
M5	Switch	SD-116	Band Selector (Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Cabinet	MD-2100B	

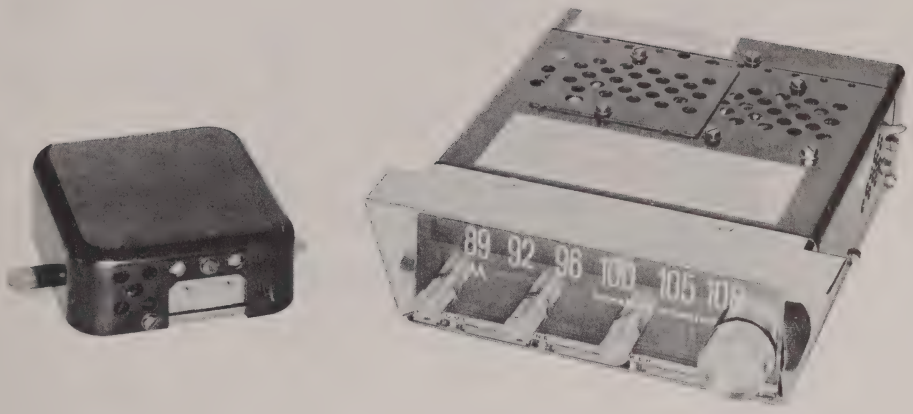
CHASSIS—TOP VIEW



PHOTOFACT® Folder

MOTOROLA
MODEL FM-900

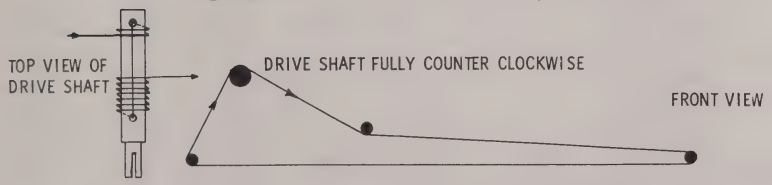
MOTOROLA
MODEL FM-900



MOTOROLA
MODEL FM-900

TRADE NAME	Motorola Model FM-900
MANUFACTURER	Motorola, Inc., 4545 W. Augusta Blvd., Chicago 39, Illinois
TYPE SET	Battery Operated 7 Tube-3 Transistor Universal Type Automobile FM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 2 Amp. @12.6 Volts DC
TUNING RANGE	88 – 108MC

TUNING DRIVE CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KD371

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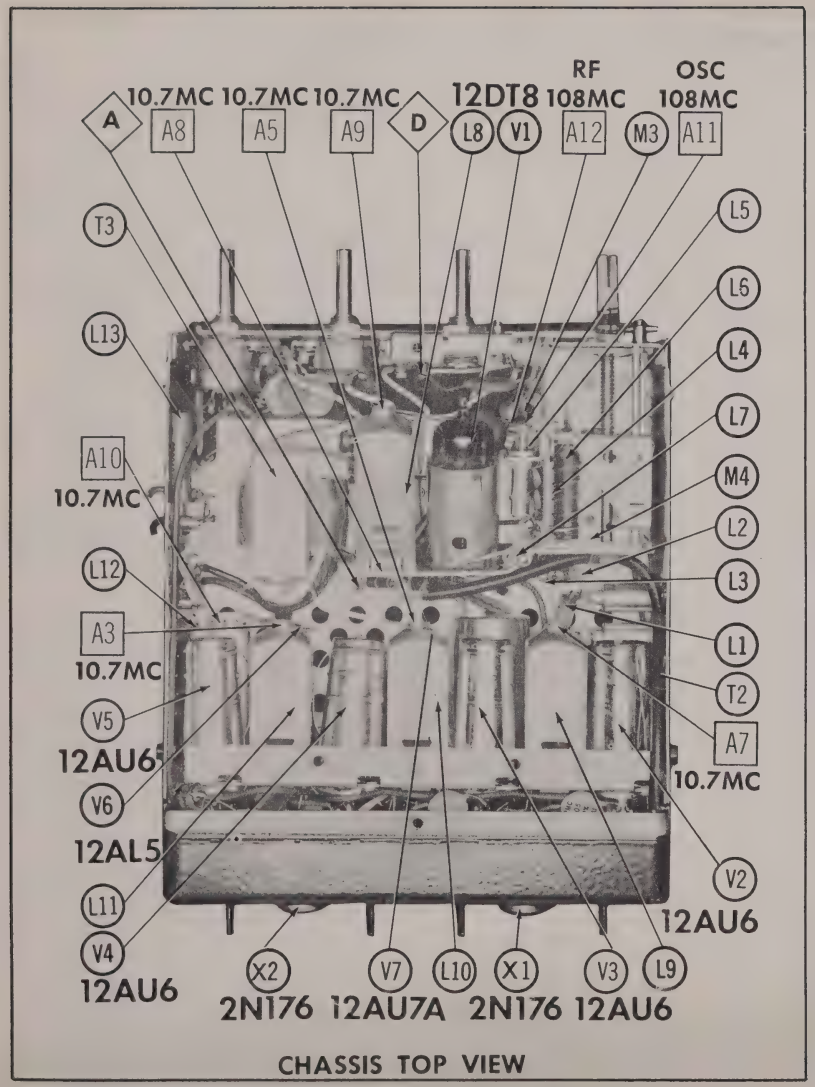
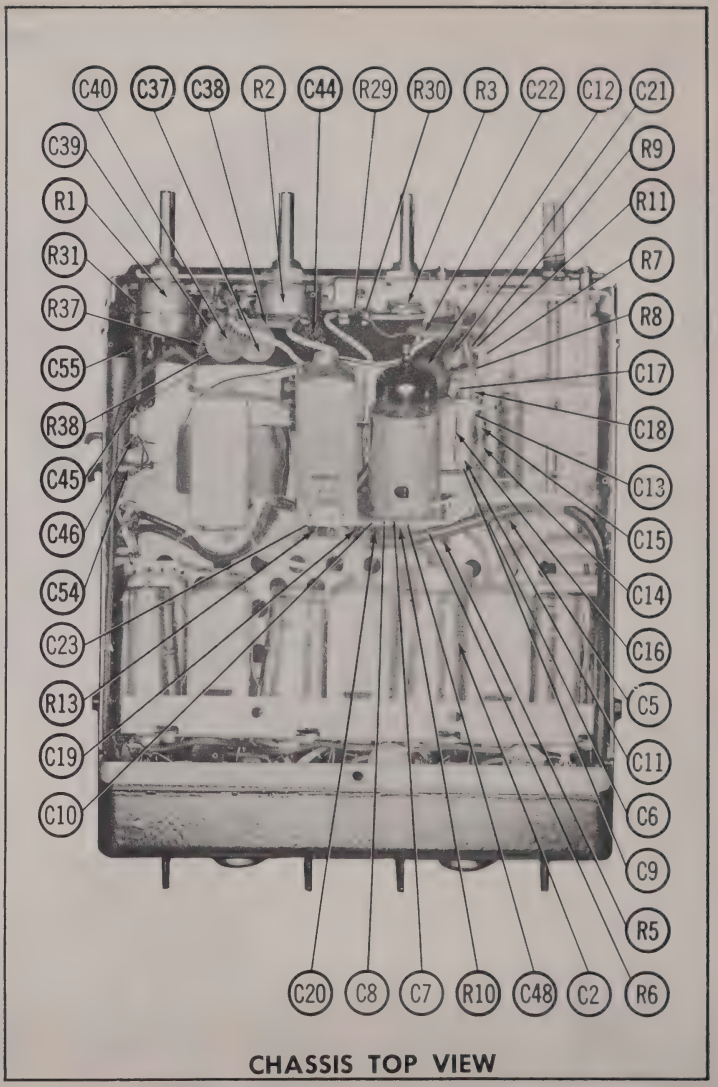
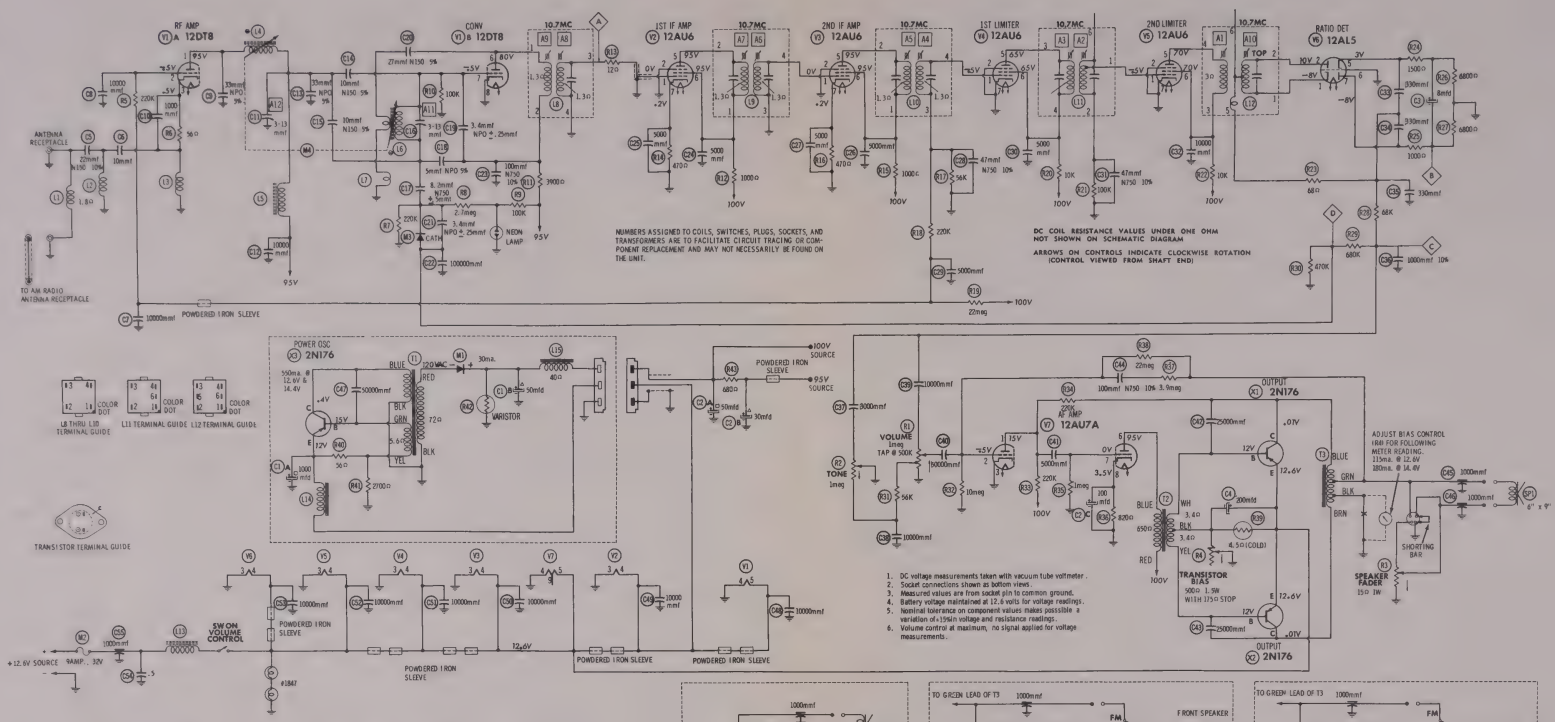
SET 524 FOLDER 13


A
10.7MC
A8
10.7MC
A5
10.7MC
A9
D
12DT8
L8
V1
RF
108MC
A12
M3
OSC
108MC
A11
T3
L13
A10
10.7MC
L12
A3
10.7MC
V5
12AU6
V6
12AL5
L11
V4
12AU6
X2
2N176
V7
12AU7A
L10
X1
2N176
V3
12AU6
L9
L5
L6
L4
L7
M4
L2
L3
L1
T2
A7
10.7MC
V2
12AU6
CHASSIS TOP VIEW


C40
C37
C38
R2
C44
R29
R30
R3
C22
C12
C21
C39
R1
R31
R37
C55
R38
C45
C46
C54
C23
R13
C19
C10
R9
R11
R7
R8
C17
C18
C13
C15
C14
C16
C5
C11
C6
C9
R5
R6
C20
C8
C7
R10
C48
C2
CHASSIS TOP VIEW

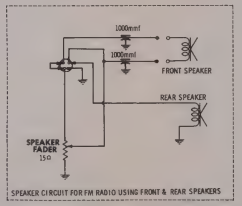

RF AMP Y1 A 12DT8
CONV Y1 B 12DT8
10.7MC
1ST IF AMP Y2 12AU6
2ND IF AMP Y3 12AU6
1ST LIMITER V4 12AU6
2ND LIMITER Y5 12AU6
RATIO DET Y6 12AL5
ANTENNA RECEPTACLE
TO AM RADIO ANTENNA RECEPTACLE
POWDERED IRON SLEEVE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
POWER OSC X3 2N176
VOLUME 1meg TAP @ 500K
TONE 1meg
AF AMP 12AU7A
OUTPUT X1 2N176
OUTPUT X2 2N176
TRANSISTOR BIAS 500Ω 1.5W WITH 375Ω STOP
ADJUST BIAS CONTROL IRAI FOR FOLLOWING METER READING. 115ma. @ 12.6V 185ma. @ 14.4V
SHORTING BAR
SPEAKER FADER 15Ω 1W
SW ON VOLUME CONTROL
+12.6V SOURCE
RAMP... 3.2V
#1847
100V SOURCE
9.5V SOURCE
VARISTOR
TRANSISTOR TERMINAL GUIDE
L8 THRU L10 TERMINAL GUIDE
L11 TERMINAL GUIDE
L12 TERMINAL GUIDE
COLOR DOT

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

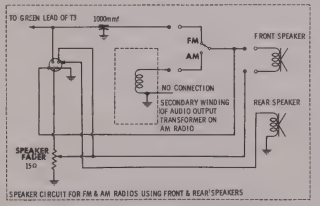
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DT8	†720Ω	500K	56Ω	0Ω	.1Ω	†4600Ω	108K	0Ω	NC
V2	12AU6	13Ω	0Ω	0Ω	.1Ω	†1000Ω	†1000Ω	470Ω		
V3	12AU6	13Ω	0Ω	0Ω	.1Ω	†1000Ω	†1000Ω	470Ω		
V4	12AU6	56K	0Ω	0Ω	.1Ω	†10K	†10K	0Ω		
V5	12AU6	100K	0Ω	0Ω	.1Ω	†10K	†10K	0Ω		
V6	12AL5	1.2meg	1.2meg	0Ω	.1Ω	8300Ω	0Ω	7800Ω		
V7	12AU7A	†220K	8meg	0Ω	0Ω	.1Ω	†690Ω	1meg	820Ω	NC

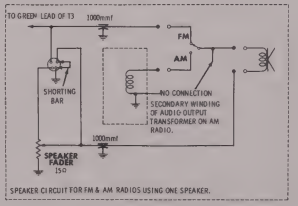
† MEASURED FROM OUTPUT OF MIL. NC NO CONNECTION



SPEAKER CIRCUIT FOR FM RADIO USING FRONT & REAR SPEAKERS



SPEAKER CIRCUIT FOR FM & AM RADIOS USING FRONT & REAR SPEAKERS



SPEAKER CIRCUIT FOR FM & AM RADIOS USING ONE SPEAKER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA
MODEL FM-900

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT	
Suggested Alignment Tools:	A1 Thru A10...GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
	A11, A12.....GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .001mfd to point (A). Low side to chassis.	10.7MC (Unmod.)	High end stop.	DC probe to point (B). Common to chassis.	A1, A2, A3, A4, A5, A6, A7	Adjust for maximum deflection.
2.	High side to antenna receptacle. Low side to chassis.	"	"	"	A8, A9	"
3.	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to point (A). Low side to chassis.	10.7MC (450KC Swp)	High end stop.	Vert. amp. to point (B). Low side to chassis.	A1, A2, A3, A4, A5, A6, A7	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	High side to antenna receptacle. Low side to chassis.	"	"	"	A8, A9	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C3.
3.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A10	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

Short Point (D) to chassis.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side to antenna receptacle. Low side to chassis.	108MC (Unmod.)	108MC	DC probe to point (B). Common to chassis.	A11, A12	Adjust for maximum deflection.

FIG. 1

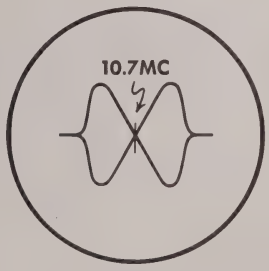
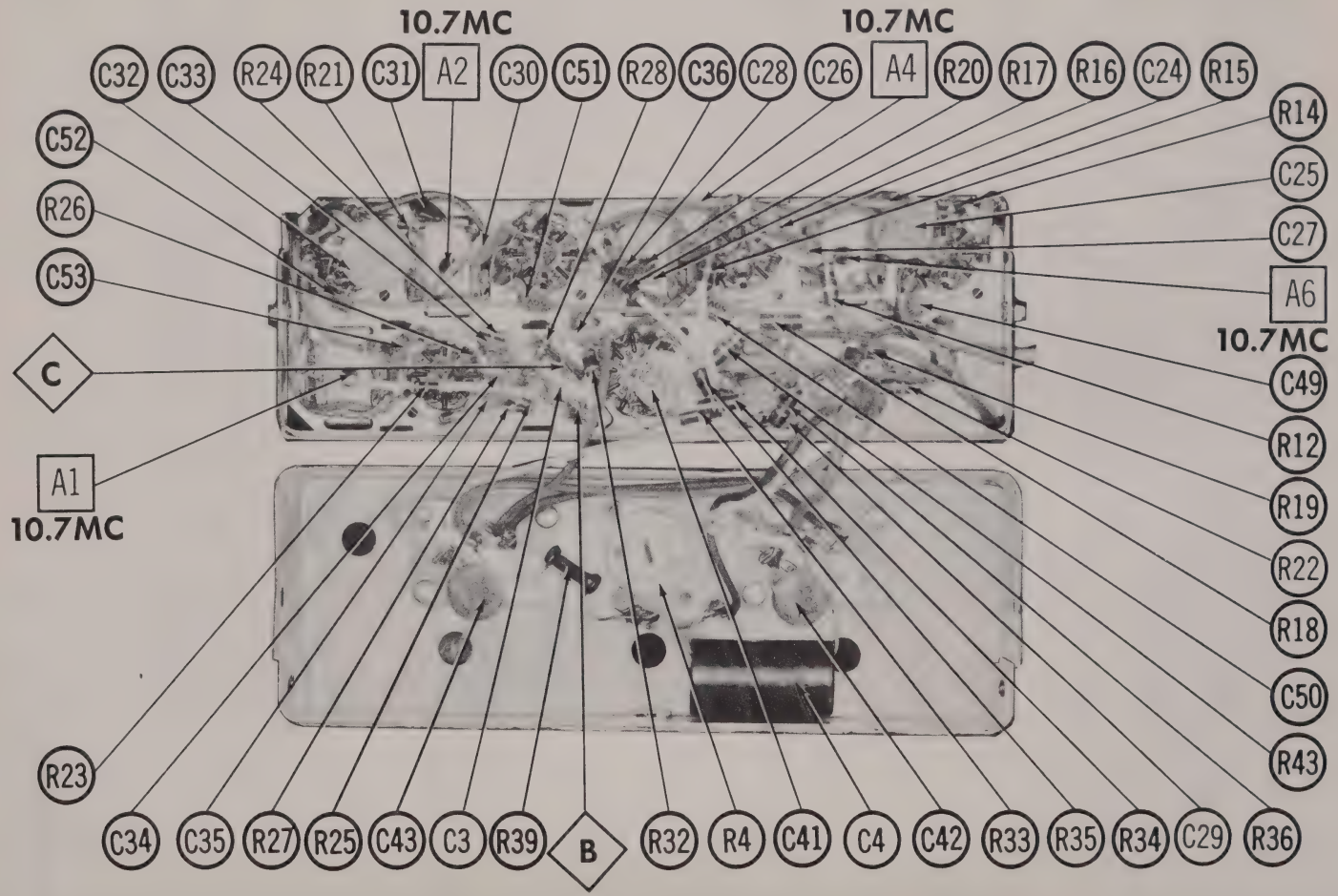


FIG. 2



CHASSIS-END VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	RF Amplifier-Conv.	12DT8
V2	1st IF Amplifier	12AU6
V3	2nd IF Amplifier	12AU6
V4	1st Limiter	12AU6
V5	2nd Limiter	12AU6
V6	Ratio Detector	12AL5
V7	AF Amplifier	12AU7A

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA: RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	2N176	Output			2N176	PNP
X2	2N176	Output			2N176	PNP
X3	2N176	Power Osc.			2N176	PNP

ELECTROLYTIC CAPACITORS

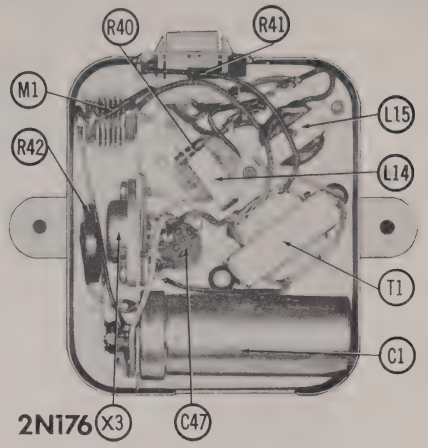
ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■1000	16	23B544096	AFH2-77-20				TVL-1165	
B	▲50	150						TVA-1414	
C2A	■50	150	23B544097	AFH3-66-25		FP213			
B	▲30	150				TC2501			
C	100	16							
C3	8	25	23B544392	PTT-25008	NLW8-100	TT25X8	MLV10-25	TE-1203.5	
C4	200	3	23B539617	SRE3V200	BR2501	TC304	TD-250-6	TVA-1102	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	22 N150 10%	#21R120539				*		10TCP-Q22
C6	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	33 NPO 5%			DTZ-33	C10Q33C		CNO-433	10TCC-Q33
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	3-13	#21K792590						
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	33 NPO 5%			DTZ-33	C10Q33C		CNO-433	10TCC-Q33
C14	10 N150 5%	#21R125698				*		10TCP-Q10
C15	10 N150 5%	#21R125698				*		10TCP-Q10
C16	3-13	#21K792590						
C17	8.2 N750 ± .5mmf				C10V82U			10TCC-V82
C18	5 NPO 5%		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C19	3.4 NPO ± .25mmf		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C20	27 N150 5%	#21R122050				*		10TCP-Q27
C21	3.4 NPO ± .25mmf		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C22	100000			DDA-104	H-05P1	DP-2-104	TA-010	TG-P10
C23	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C26	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C27	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C28	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C29	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C31	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C34	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C35	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C36	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C37	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	10TS-D30
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

POWER CHASSIS



FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C40	50000		BPD-05	DD-503	CUB2S5	1DP-2-503	GP150	5HK-S50
C41	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C42	25000				DPMS6S25	4DP-2-253	GEM-4125	TH-S25
C43	25000				DPMS6S25	4DP-2-253	GEM-4125	TH-S25
C44	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C45	1000		EF-001	MFT-1000		CCF-102	CT280A	
C46	1000		EF-001	MFT-1000		CCF-102	CT280A	
C47	50000		BPD-05	DD-503	CUB2S5	1DP-2-503	GP150	5HK-S50
C48	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C51	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C54	.5 100V		P288N-5		CUB2P5	1DP-4-504	GEM-205	2TM-P50
C55	1000		EF-001	MFT-1000		CCF-102	CT280A	

Motorola Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	18B544098	ABT-74	A47F5-1meg	B19-137X	UT-443	Volume
	500K Tap							
B	Shaft			AK-8	RS-3/16	SK9	DS-37	
C	Switch			KR-4	SWE-13	76-1	US-26	Power Off-On
R2A	1meg	½	18B544099	AB-70	A47-1meg-S	B13-137	U53	Tone
B	Shaft			AK-8	RS-3/16	SK9	DS-37	
R3	15Ω	1WW	18B544095					Speaker Fader
R4	500Ω	1.5WW	18K537172		39-500-100	112-500-100	FL600S	Transistor Bias
	175Ω Stop							

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	220K			
R6	56Ω			
R7	220K			
R8	2.7meg			
R9	100K			
R10	100K			
R11	3900Ω			
R12	1000Ω			
R13	12Ω			
R14	470Ω			
R15	1000Ω			
R16	470Ω			
R17	56K			
R18	220K			
R19	22meg			
R20	10K			
R21	100K			
R22	10K			
R23	68Ω			
R24	1500Ω			
R25	1000Ω			
R26	6800Ω			
R27	6800Ω			
R28	68K			
R29	680K			
R30	470K			
R31	56K			
R32	10meg			
R33	220K			
R34	220K			
R35	1meg			
R36	820Ω			
R37	3.9meg			
R38	22meg			
R39	4.5Ω Cold			Pt. #6K542967
R40	56Ω			
R41	2700Ω			
R42	VARISTOR			Pt. #6A544229
R43	680Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	Ant. Coil(2.2uh)	24K780128 ①	BC-563	9310-20	RTC-8517	① IRC Part #CLA.
L2	RF Choke	24K544398				② Part of Tuner Ass'y. M4.
L3	Cathode Choke	24K544398				
L4	RF Coil	24B544357 ②				
L5	RF Choke	24A544400				
L6	Osc. Coil	24K544358 ②				
L7	RF Choke	24K544399				
L8	1st IF	24K544395	FM-254	1463	RTC-8599	
L9	2nd IF	24C544393	FM-254	1463	RTC-8599	
L10	3rd IF	24C544393	FM-254	1463	RTC-8599	
L11	4th IF	24K544394				
L12	Ratio Detector	24C638488	FM-255	1465	RTC-8600	
L13	Hash Choke(10uh)	24A538914		5220	RTC-9182	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L14	.560A	.5Ω	300 MH	25K544227					
L15	.030A	40Ω		25K544233					

TRANSFORMER (POWER OSC.)

ITEM No.	RATING: INPUT	OUTPUT	SEC. 2	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	12.6V	120VAC @ .030A AC		25C544232					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO: PRI.	SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4	1	25B544230					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	40Ω Tap @ 3-4Ω	25B544231					

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	6"x 9"	PM	3-4Ω	50K544501	69A3	

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: MOTOROLA PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.030A	48K543405 *	1N1763 ♦	65 *	SR200 ♦	* Selenium ♦ Silicon

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	SFE	9A 32V	65R16248	1V541705	307009 (SFE 9A 32V)	155009	SFE 9	HHH

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3		21A544085				AFC Diode

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuner Switch Ass'y.	77C544326 1V64965A02	MT-309, Complete Speaker (FM-AM)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Background	64B544090	Dial
Background	64B544080	Pointer
Scale	34C544275	Dial
Pointer	52C544104	Dial
Knob	36B544086	Tuning
Knob	36B543382	Function Selector
Knob	36B544088	Volume, Tone, Speaker

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT® Folder

PACEMAKER
MODEL PM 75

PACEMAKER
MODEL PM 75

PACEMAKER
MODEL PM 75

TRADE NAME	Pacemaker Model PM75
MANUFACTURER	Bell Sound Div., Thompson Ramo Wooldridge Inc., 555 Marion Road, Columbus 7, Ohio
TYPE SET	AC Operated 7 Tube Audio Amplifier
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 130 Watts, 1.5 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KX318

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Mic 3 Preamp. - Mic 2 Preamp.	ECC83/12AX7	V4	AF Amp. -Phase Inv.	ECC83/12AX7
V2	Mic 1 Preamp.	12AV6	V5	Output	EL34/6CA7
V3	AF Amp.	12AV6	V6	Output	EL34/6CA7
			V7	Rectifier	GZ34/5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PACEMAKER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	40	450	23A73	PRS1750	BR4045	TC78	TD-40-450	TVA-1712	
C2A	▲20	500	23B66			FP475	TMQ-4779	TVLS-4938 *	
B	20	450							
C	▲20	450							
D	▲20	450							
C3A	■80	150	23B31	AFH3-12-20	C0100	FP311.8	TMT-3142	TVLS-3444.3*	
B	40	150							
C	▲40	150							
C4	20	6	23B8	XPP-6020	NLW20-6	TT15X20	MLV25-6	TE-1090	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C11	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C12	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C13	5000 10%		DI-5000			CCD-502	JL-250	10TS-D50
C14	470 10%		DI-470	DD-471		CCD-471	GP347	10TS-T47
C15	100 10% N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C16	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C18	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50
C19	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50

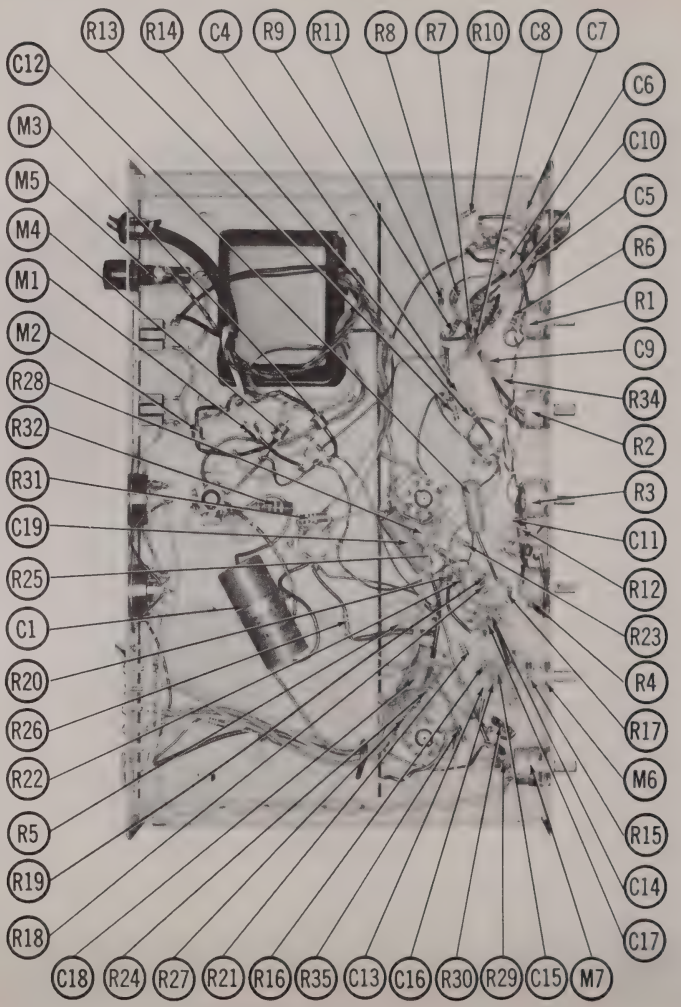
CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PACEMAKER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	15B86	B-70	A47-1meg-Z	Q13-137	U53	Mic 1 Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	15B86	B-70	A47-1meg-Z	Q13-137	U53	Mic 2 Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	15B86	B-70	A47-1meg-Z	Q13-137	U53	Mic 3 Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1meg	½	15B86	B-70	A47-1meg-Z	Q13-137	U53	Phono Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	20K	½	15B80	F1-27		† QJ-1506R	■ UE4192	Bias, #2 Output
B	20K	½		R2-27				Bias, #1 Output

† "CONCENTRIKIT" equivalent: K-8 Kit with base elements & shafts: B11-119, P19-012 (Panel); B11-119, R15-005 (Rear); R5 (Retainer)
(Not available as a factory assembled unit).

■ "STA-LOC" equivalent: FA253L, RU253L, O6437A, IK625.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R6	4.7meg			
R7	100K			
R8	4.7meg			
R9	100K			
R10	4.7meg			
R11	100K			
R12	390K			
R13	100K			
R14	2700Ω			
R15	270K			
R16	47K			
R17	1meg			
R18	270K			
R19	220K			
R20	1meg			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R21	47K			
R22	1500Ω			
R23	47K			
R24	330K			
R25	330K			
R26	10K			
R27	1000Ω 2W			
R28	1000Ω 2W			
R29	10Ω			
R30	10Ω			
R31	39K 1W			
R32	18K 2W			
R33	450Ω 10W	PW10-450Ω	10W-SQ-450	
R34	200Ω 5W	PW5-200Ω	5W-SQ-200	
R35	2200Ω			
R36	68K			

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	PACEMAKER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	125V ⓐ 1.5A Tap ⓐ 117V ⓐ 1.5A	840V CT ⓐ .100A DC	5V ⓐ 1.9A	32B107 ①					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ⓐ 3.3A	100V ⓐ .3A							

① 60~ Unit. 50-60~ Unit available for 120-220V operation (Part #32B108).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PACEMAKER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4100Ω CT Tap ⓐ 5200Ω CT	500Ω Tap ⓐ 70V, 16Ω, 8Ω, 4Ω	32B105					

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	PACEMAKER PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.150A	42A11 *	1N1763 *	40H *	SR500 *	* Silicon Type
M2	.150A	42A11 *	1N1763 *	40H *	SR500 *	
M3	.150A	42A11 *	1N1763 *	40H *	SR500 *	
M4	.150A	42A11 *	1N1763 *	40H *	SR500 *	

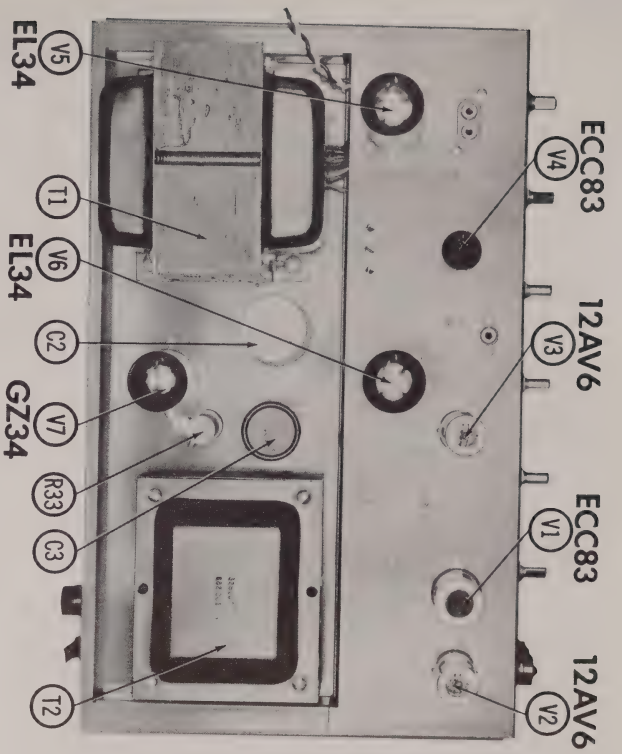
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PACEMAKER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M5	3AG	3A 125V S/B	53A7	53B5	313003 (3AG 3A 125V S/B)	342001	MDX 3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	PACEMAKER PART No.	NOTES
M6	Switch	B20033-P8	Acoustic (Rotor Wafer)
M7	Switch	B20105-P20	Off-On (Rotary Snap Toggle)

CHASSIS—TOP VIEW



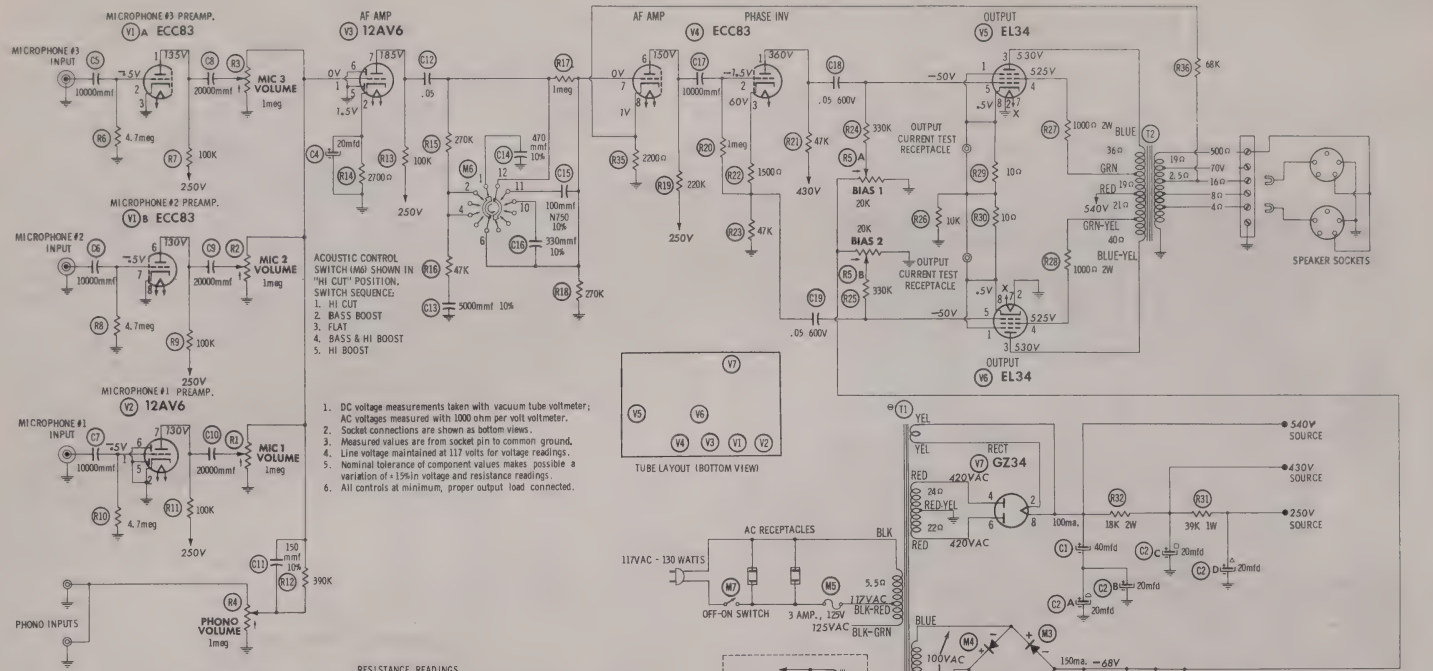
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob Handle	84A31 13A0132	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83	†157K	4.7meg	0Ω	18Ω	6Ω	†157K	4.7meg	0Ω	NC
V2	12AV6	4.7meg	0Ω	6Ω	0Ω	0Ω	0Ω	†157K		
V3	12AV6	500K	2700Ω	50Ω	56Ω	0Ω	0Ω	†157K		
V4	ECC83	†65K	1meg	48K	68Ω	56Ω	†277K	270K	2200Ω	NC
V5	EL34	20Ω	0Ω	†55Ω	†1000Ω	330K	NC	.1Ω	20Ω	
V6	EL34	20Ω	0Ω	†61Ω	†1000Ω	330K	NC	.1Ω	20Ω	
V7	GZ34	TP	¶	NC	24Ω	NC	22Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V7.
NC NO CONNECTION
TP TIE POINT

❸ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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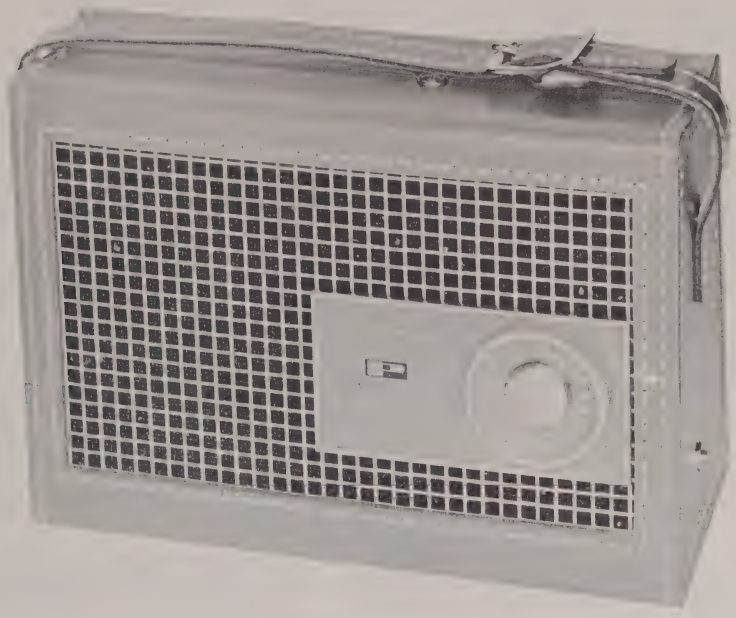
PACEMAKER MODEL PM 75

PHOTOFACT® Folder with CIRCUITRACE®

PHILCO MODEL T-802

PHILCO
MODEL T-802



TRADE NAME	Philco Model T-802 (Code 124)		
MANUFACTURER	Philco Corp., Tioga & C Streets, Philadelphia, Pa.		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	15MA @ 6 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	535 — 1620KC		30MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A3, A4.... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A6, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	600KC	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1620KC	Tuning gang fully open.	"	A6	"
4.	"	1400KC	1400KC Signal.	"	A7	Adjust for maximum output. Repeat Steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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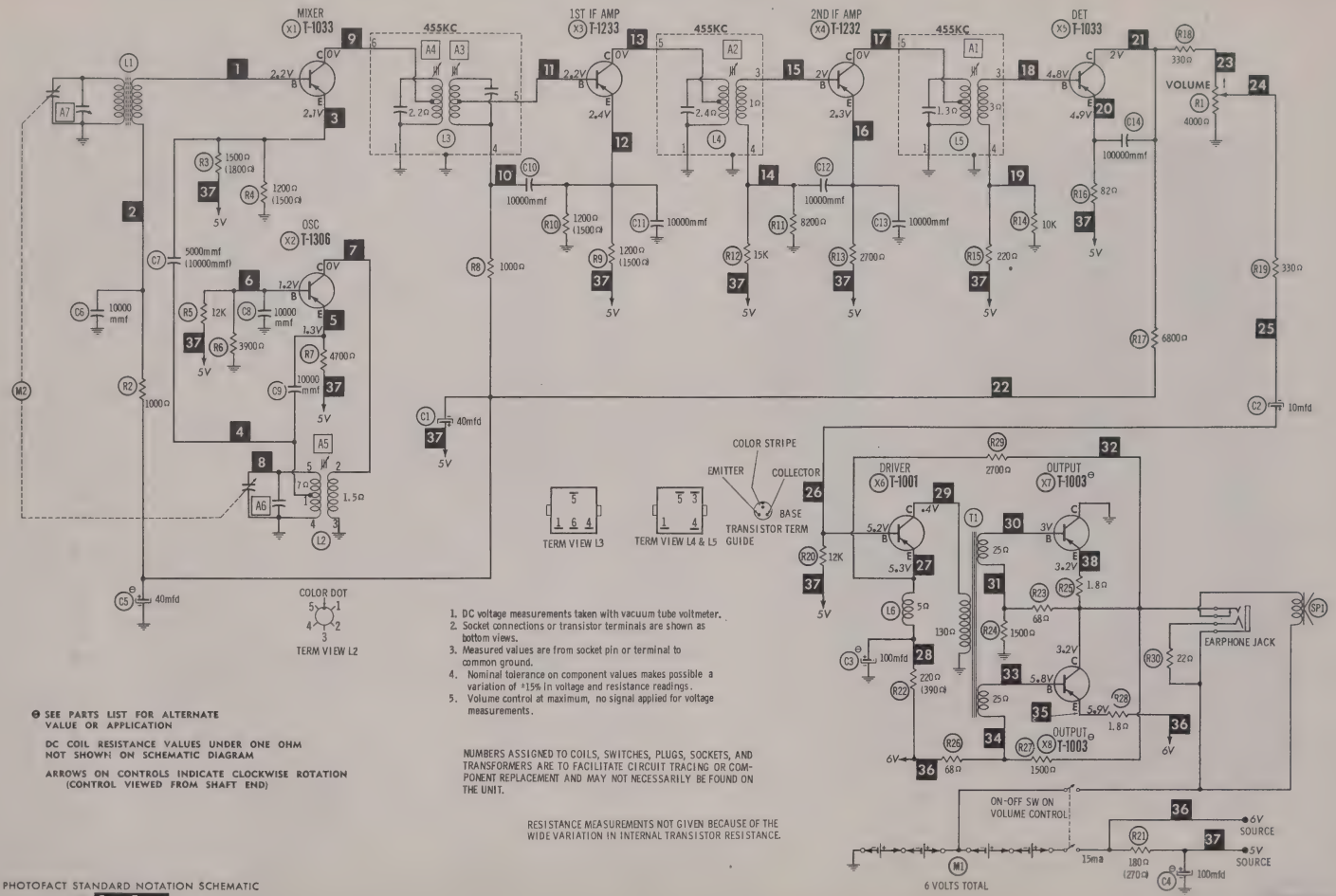
KF325

SET 524 FOLDER 15



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

Ⓔ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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PHILCO MODEL T-802

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	T-1033	Mixer		2N486		PNP
X2	T-1306	Oscillator				PNP
X3	T-1233	1st IF Amplifier				PNP
X4	T-1232	2nd IF Amplifier		2N483		PNP
X5	T-1033	Detector				PNP
X6	T-1001	Driver	2N406	2N362	2N406	PNP
X7	T-1003 *	Output	2N408	2N632		PNP) Matched
X8	T-1003 *	Output	2N408	2N632		PNP) Pair

* Alternate Type T-1007.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	40	6	30-2588-3	PTT-6040	NLW40-6	TT6X40	ML40-6	TE-1095	
C2	10	6	30-2591-9	PTT-6010	NLW10-6	TT6X10	ML10-6	TE-1087	
C3	100	6	30-2588-4	SRE6V100	NLW100-12	TT6X100	ML100-6	TE-1102	Note 1
C4	100	6	39-2588-4	SRE6V100	NLW100-12	TT6X100	ML100-6	TE-1102	Note 2
C5	40	6	30-2588-3	PTT-6040	NLW40-6	TT6X40	ML40-6	TE-1095	Note 3

Note 1. Run 53 uses 200mfd in this application (Part #30-2588-8).
Note 2. Run 53 uses 500mfd in this application (Part #30-2588-7).
Note 3. Not used in Run 53.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C7	5000	(10000) †	BPD-005	DD-502	H-05D5	CCD-502	TA-250	TG-D50
C8	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C9	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C10	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C11	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C12	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C13	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C14	100000 10V			UK10-104	H-05P1		TA-010	TG-P10

† Alternate Value

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	4000Ω	1/2	33-5575-25					Volume & Switch

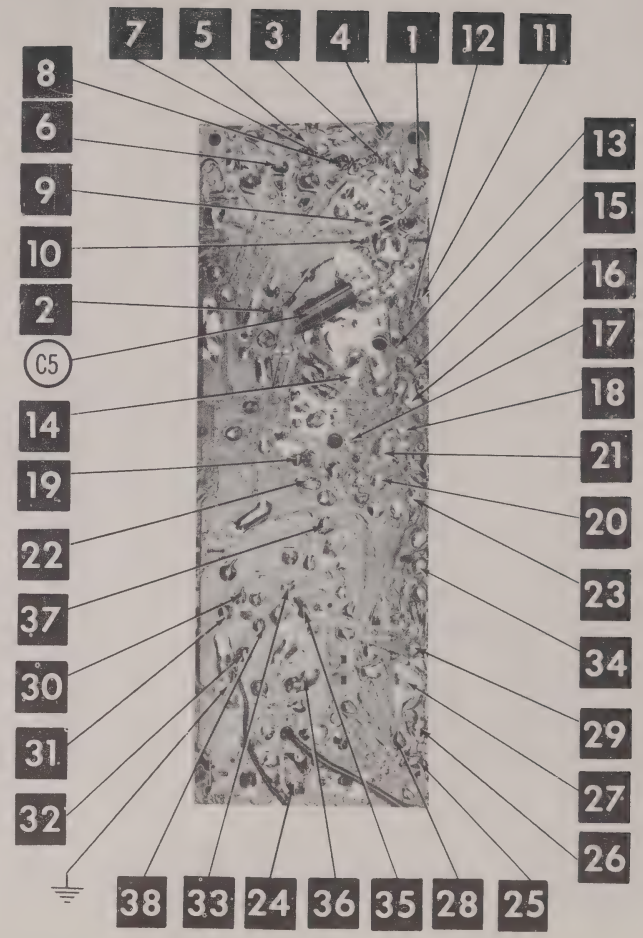
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R2	1000Ω			
R3	1500Ω			(1800Ω) *
R4	1200Ω			(1500Ω) *
R5	12K			
R6	3900Ω			
R7	4700Ω			
R8	1000Ω			
R9	1200Ω			(1500Ω) *
R10	1200Ω			(1500Ω) *
R11	8200Ω			
R12	15K			
R13	2700Ω			
R14	10K			
R15	220Ω			
R16	82Ω			
R17	6800Ω			
R18	330Ω			
R19	330Ω			
R20	12K			
R21	180Ω			(270Ω) *
R22	220Ω			(390Ω) *
R23	68Ω			
R24	1500Ω			
R25	1.8Ω			

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA IRC PART No	WORKMAN TV PART No	REMARKS
R26	68Ω			
R27	1500Ω			
R28	1.8Ω			
R29	2700Ω			
R30	22Ω			

* Value used in later production.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PHILCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	Loopstick	32-4668-1				
L2	Osc.	32-4669-9				
L3	1st IF	32-4738-14				
L4	2nd IF	32-4738-2				
L5	3rd IF	32-4738-3				
L6	RF Choke(400uh)	32-4685-1	TV-202	6136	RTC-8579	

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	SEC.	REPLACEMENT DATA PHILCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2	1	32-8947-1					
		SEC. 2						
		1						

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	QUAM PART No.	NOTES
SP1	4"	PM	10-12Ω	36-1675-13	4A1ZI2	

BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V	P-920 or P-907		230		A100		M-13R	4 Required

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	Tuning Cap.	31-2790-10	2 Gang
	Printed Board	54-6497-1	

CABINETS & CABINET PARTS

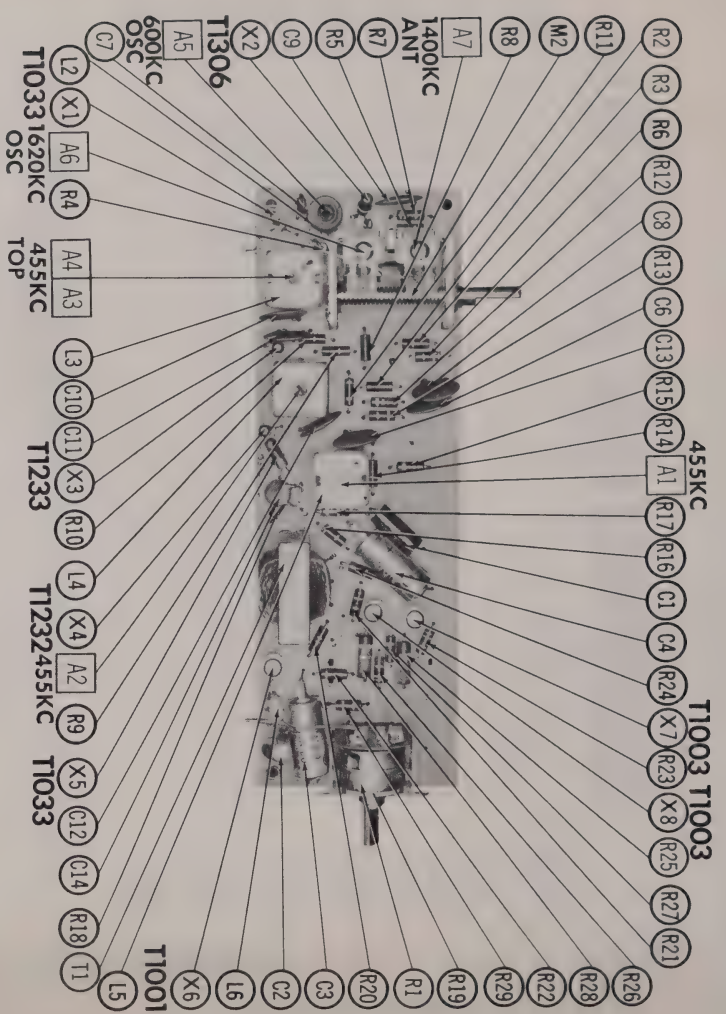
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

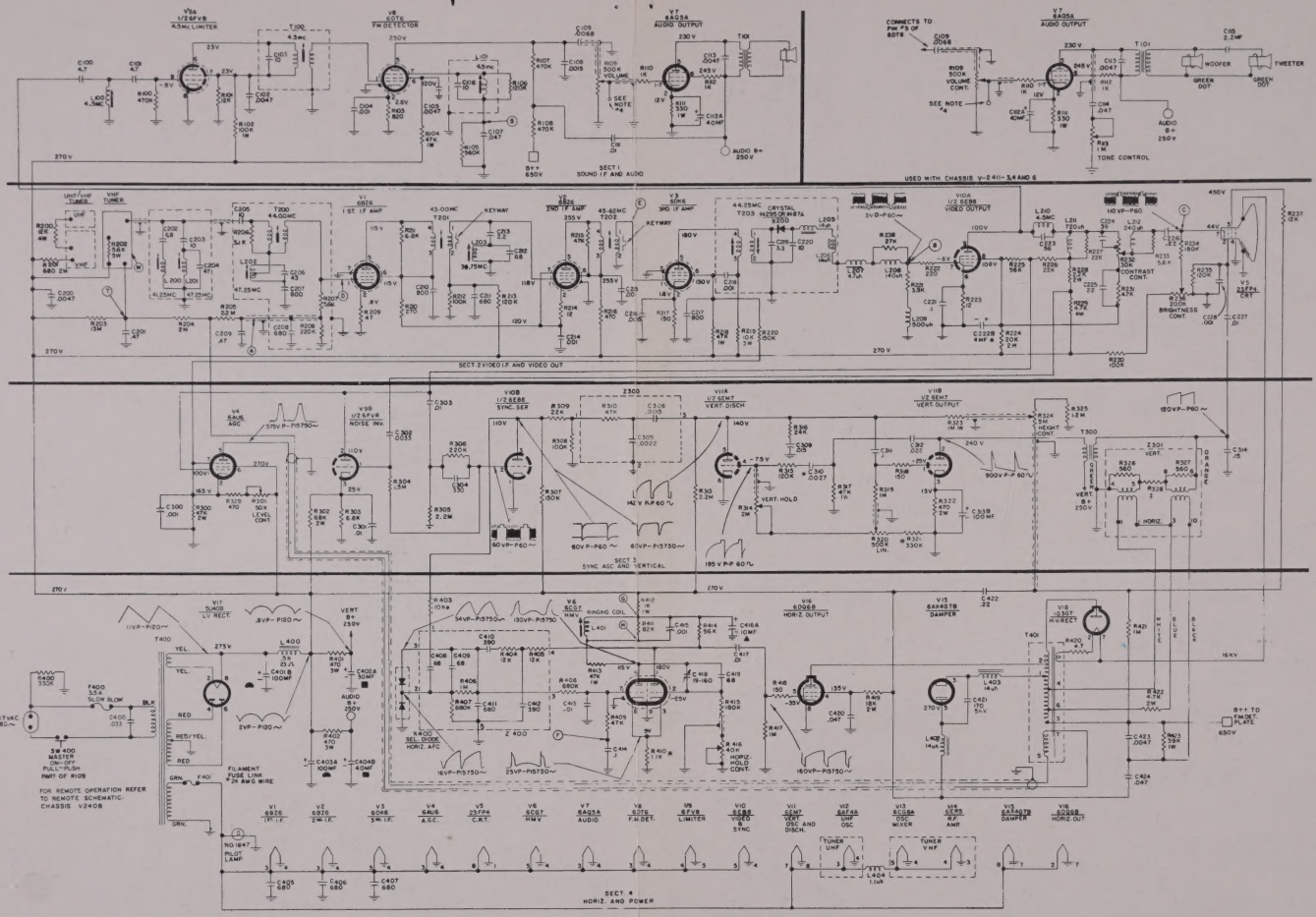
NAME	PART NO.	DESCRIPTION
Knob	424-8114	Tuning
Knob	424-8113	Volume
Cabinet	28-13322-1	Front Panel Overlay
Cabinet	51-0134-1	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW





WESTINGHOUSE MODELS H-K4010, U, 11, U, 12, U, 13, U, 50, 51, 52, 53, H-K4110, U, 11, U, 12, U, 13, U, 50, 51, 52, 53, H-K4210, 11, U, 12, U, 13, U, 14, U, 15, U, H-T3710, U, 11, U, 12, U (CH. V-2411-1, -2, -3, -4, -5, -6)

Schematic Diagram Courtesy of Westinghouse Electric Corporation

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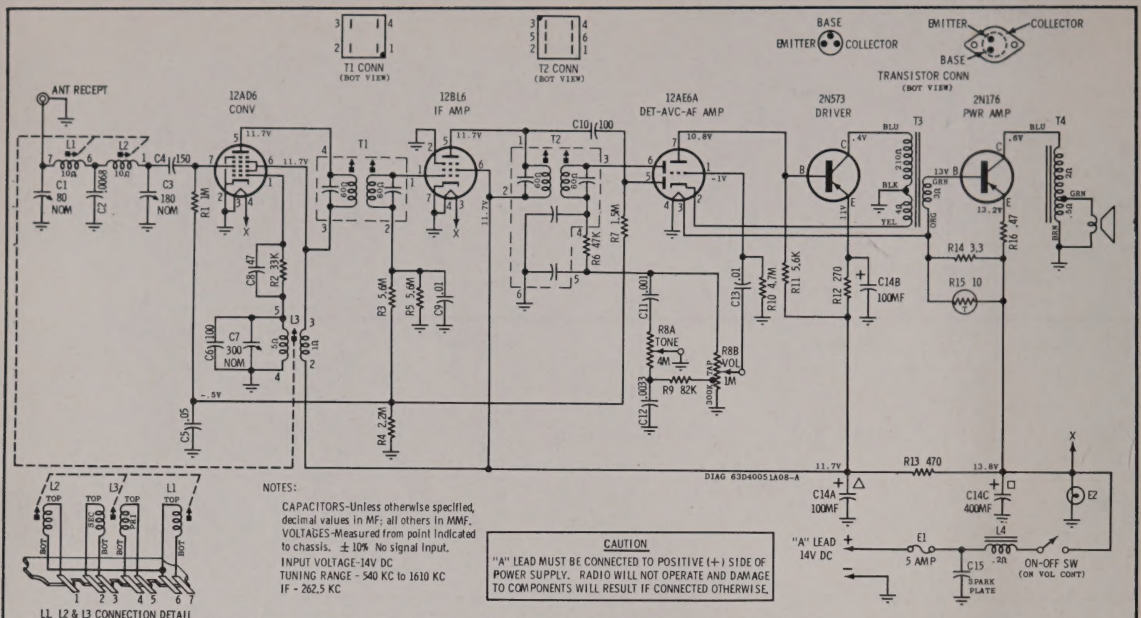
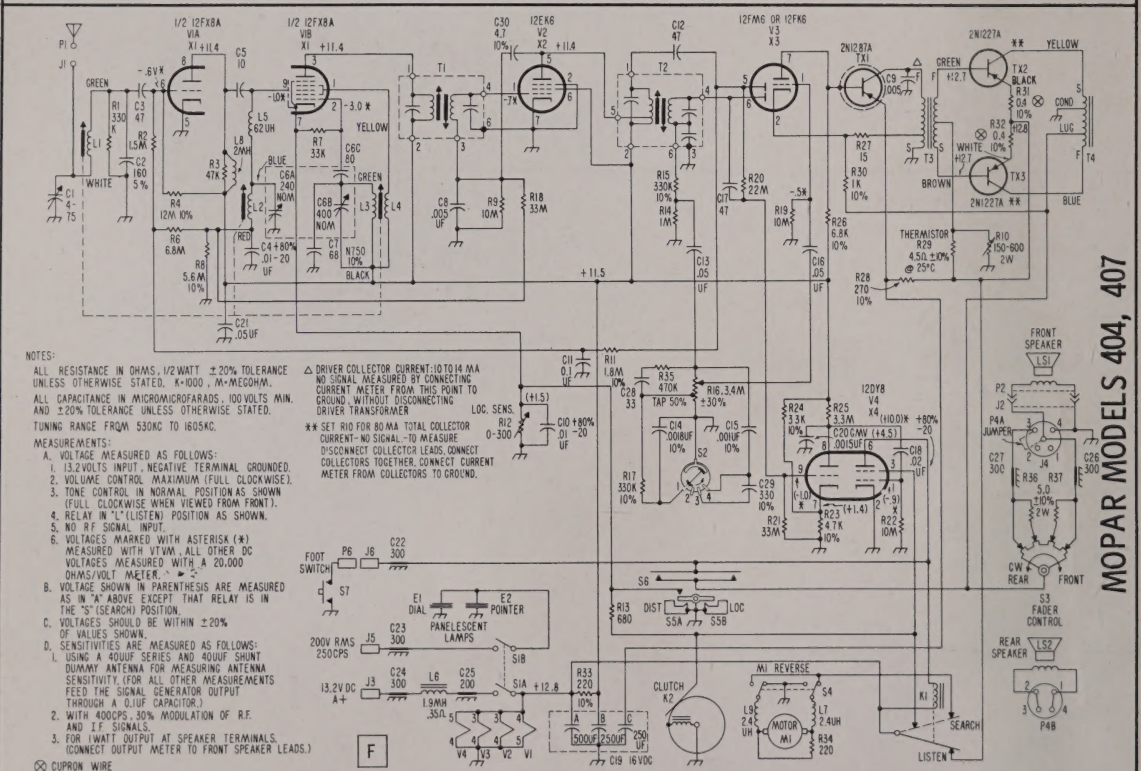

T1 CONN (BOT VIEW)
T2 CONN (BOT VIEW)
TRANSISTOR CONN (BOT VIEW)
BASE
EMITTER
COLLECTOR
ANT RECEPT
12AD6 CONV
12BL6 IF AMP
12AE6A DET-AVC-AF AMP
2N573 DRIVER
2N176 PWR AMP
DIAG 63D4005 1A08-A
L2 L3 L1 TOP
L1, L2 & L3 CONNECTION DETAIL
NOTES:
CAPACITORS-Unless otherwise specified, decimal values in MF; all others in MMF.
VOLTAGES-Measured from point indicated to chassis. ±10% No signal Input.
INPUT VOLTAGE-14V DC
TUNING RANGE - 540 KC to 1610 KC
IF - 262.5 KC
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.
"A" LEAD 14V DC
5 AMP
ON-OFF SW (ON VOL CONT)
SPARK PLATE

AMERICAN MOTORS MODELS 13MA (8990832), 13MAM (8990831)

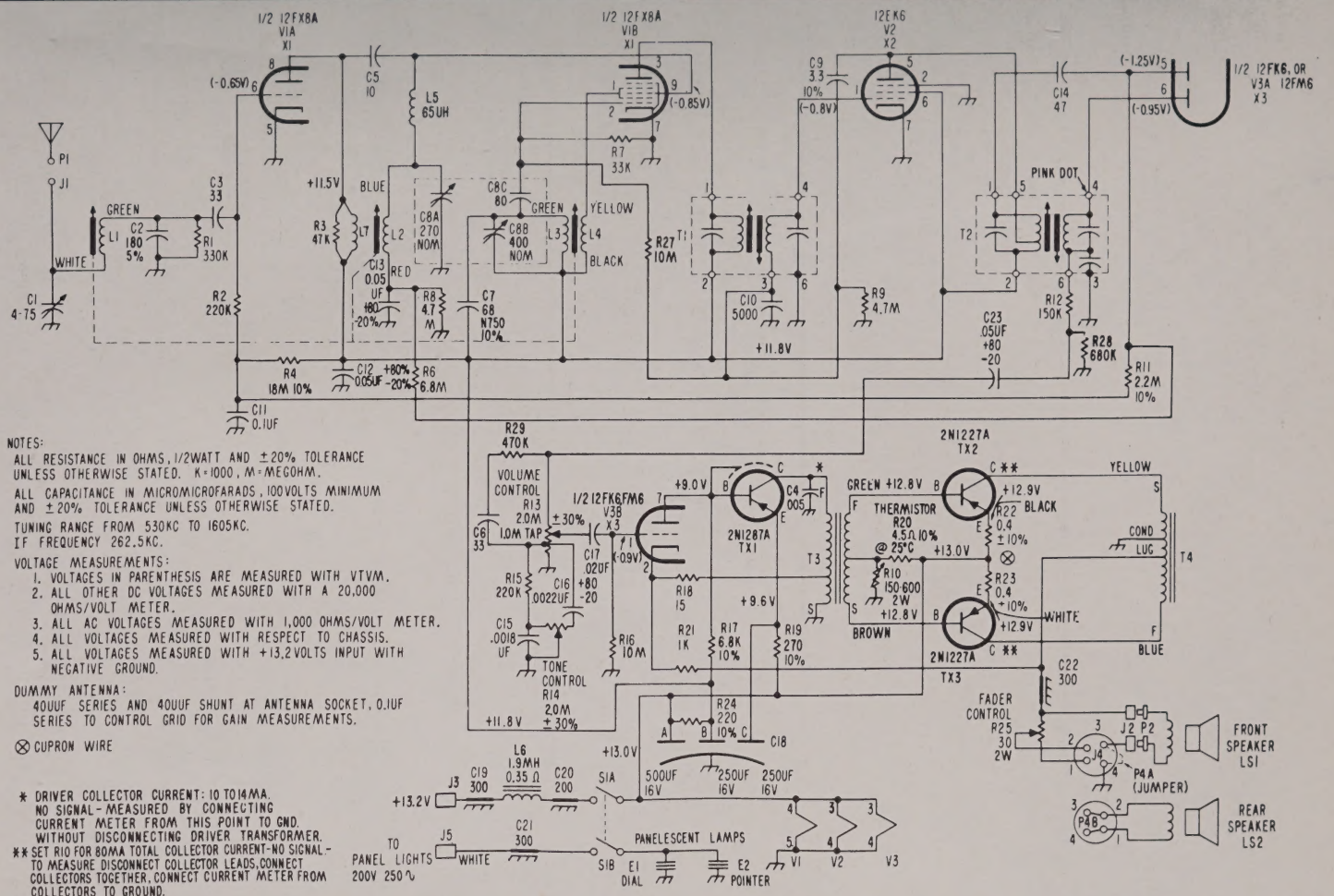
Schematic Diagram Courtesy of Motorola Inc.


NOTES:
ALL RESISTANCE IN OHMS, 1/2 WATT ±20% TOLERANCE UNLESS OTHERWISE STATED. K=1000, M=MEGOHM.
ALL CAPACITANCE IN MICROMICROFARADS, 100 VOLTS MIN. AND ±20% TOLERANCE UNLESS OTHERWISE STATED.
TUNING RANGE FROM 530KC TO 1605KC.
MEASUREMENTS:
A. VOLTAGE MEASURED AS FOLLOWS:
1. 13.2 VOLTS INPUT, NEGATIVE TERMINAL GROUNDED.
2. VOLUME CONTROL MAXIMUM (FULL CLOCKWISE).
3. TONE CONTROL IN NORMAL POSITION AS SHOWN (FULL CLOCKWISE WHEN VIEWED FROM FRONT).
4. RELAY IN "L" (LISTEN) POSITION AS SHOWN.
5. NO RF SIGNAL INPUT.
6. VOLTAGES MARKED WITH ASTERISK (*) MEASURED WITH VTVM, ALL OTHER DC VOLTAGES MEASURED WITH A 20,000 OHMS/VOLT METER.
B. VOLTAGE SHOWN IN PARENTHESIS ARE MEASURED AS IN "A" ABOVE EXCEPT THAT RELAY IS IN THE "S" (SEARCH) POSITION.
C. VOLTAGES SHOULD BE WITHIN ±20% OF VALUES SHOWN.
D. SENSITIVITIES ARE MEASURED AS FOLLOWS:
1. USING A 400UUF SERIES AND 400UUF SHUNT DUMMY ANTENNA FOR MEASURING ANTENNA SENSITIVITY. (FOR ALL OTHER MEASUREMENTS FEED THE SIGNAL GENERATOR OUTPUT THROUGH A 0.1UF CAPACITOR.)
2. WITH 400CPS, 30% MODULATION OF R.F. AND I.F. SIGNALS.
3. FOR 1WATT OUTPUT AT SPEAKER TERMINALS. (CONNECT OUTPUT METER TO FRONT SPEAKER LEADS.)
⊗ CUPRON WIRE
△ DRIVER COLLECTOR CURRENT: 10 TO 14 MA NO SIGNAL MEASURED BY CONNECTING CURRENT METER FROM THIS POINT TO GROUND WITHOUT DISCONNECTING DRIVER TRANSFORMER.
** SET R10 FOR 80 MA TOTAL COLLECTOR CURRENT - NO SIGNAL. - TO MEASURE DISCONNECT COLLECTOR LEADS. CONNECT COLLECTORS TOGETHER, CONNECT CURRENT METER FROM COLLECTORS TO GROUND.
1/2 12FX8A V1A
1/2 12FX8A V1B
12EK6 V2
12FM6 OR 12FK6 V3
2N1287A TX1
2N1227A TX2
2N1227A TX3
12DY8 V4
FOOT SWITCH
DIAL
POINTER
PANELESCENT LAMPS
CLUTCH K2
MOTOR M1
REVERSE
SEARCH
LISTEN
FRONT SPEAKER LS1
REAR SPEAKER LS2
FADER CONTROL S3
CW REAR FRONT
P4A JUMPER
P4B
F

MOPAR MODELS 404, 407

Schematic Diagram Courtesy of Bendix Radio, Division of Bendix Aviation Corp.

MOPAR MODEL 317



NOTES:

ALL RESISTANCE IN OHMS, 1/2WATT AND ±20% TOLERANCE UNLESS OTHERWISE STATED. K=1000, M=MEGOHM.

ALL CAPACITANCE IN MICROMICROFARADS, 100VOLTS MINIMUM AND ±20% TOLERANCE UNLESS OTHERWISE STATED.

TUNING RANGE FROM 530KC TO 1605KC.
IF FREQUENCY 262.5KC.

VOLTAGE MEASUREMENTS:

1. VOLTAGES IN PARENTHESIS ARE MEASURED WITH VTVM.
2. ALL OTHER DC VOLTAGES MEASURED WITH A 20,000 OHMS/VOLT METER.
3. ALL AC VOLTAGES MEASURED WITH 1,000 OHMS/VOLT METER.
4. ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS.
5. ALL VOLTAGES MEASURED WITH +13.2 VOLTS INPUT WITH NEGATIVE GROUND.

DUMMY ANTENNA:

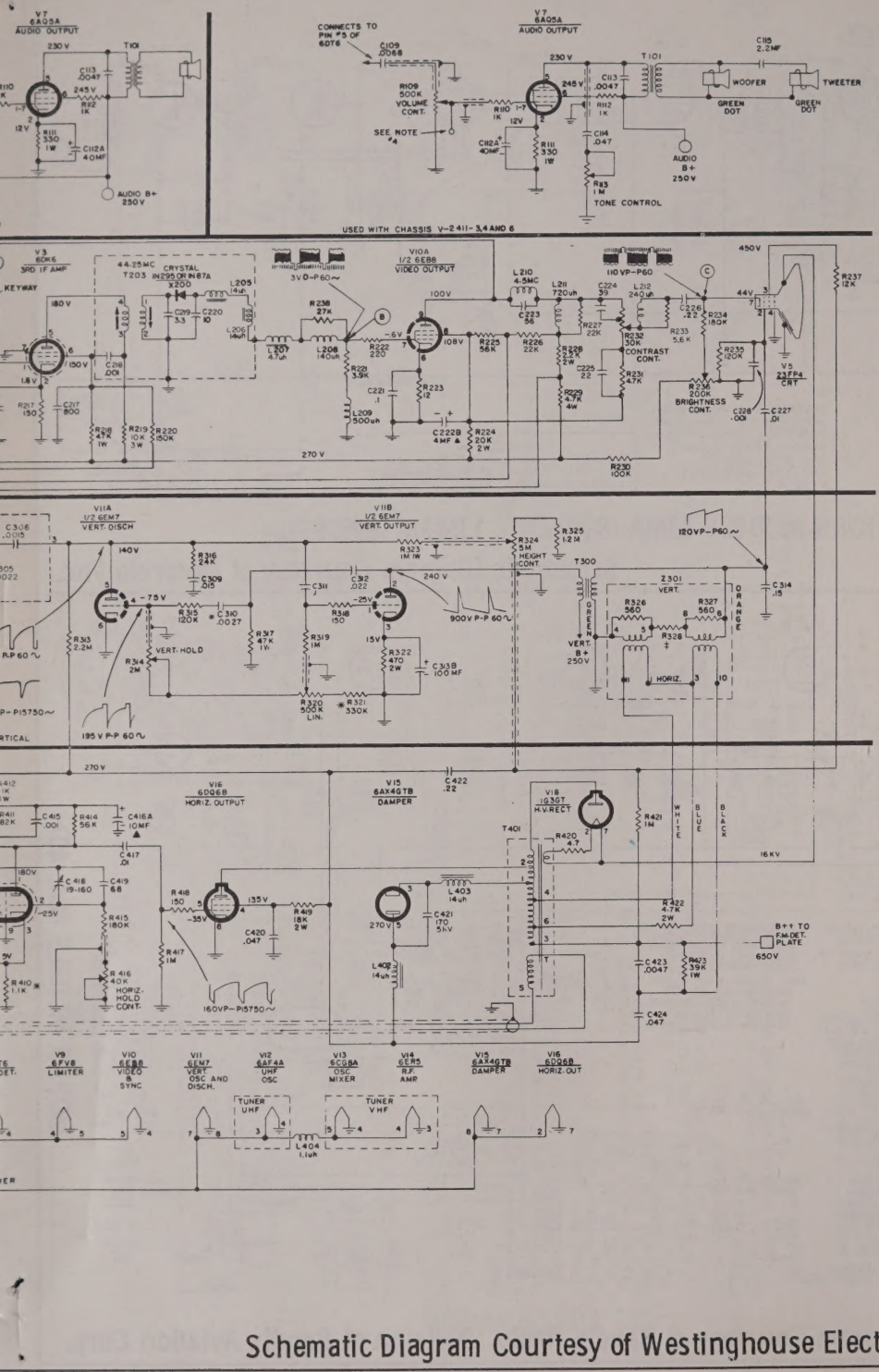
40UUF SERIES AND 40UUF SHUNT AT ANTENNA SOCKET, 0.1UF SERIES TO CONTROL GRID FOR GAIN MEASUREMENTS.

⊗ CUPRON WIRE

* DRIVER COLLECTOR CURRENT: 10 TO 14 MA. NO SIGNAL - MEASURED BY CONNECTING CURRENT METER FROM THIS POINT TO GND. WITHOUT DISCONNECTING DRIVER TRANSFORMER.

** SET R10 FOR 80MA TOTAL COLLECTOR CURRENT - NO SIGNAL - TO MEASURE DISCONNECT COLLECTOR LEADS, CONNECT COLLECTORS TOGETHER. CONNECT CURRENT METER FROM COLLECTORS TO GROUND.

Schematic Diagram Courtesy of Bendix Radio, Division of Bendix Aviation Corp.



Schematic Diagram Courtesy of Westinghouse Electric Corporation